



# **TRAFFIC INCIDENT MANAGEMENT SERVICE LAYER PLAN**

**January 2018**



**Iowa Transportation Systems Management and Operations (TSMO)  
Traffic Incident Management (TIM) Service Layer Plan  
Version 1.4**

**Prepared for:**

**Iowa Department of Transportation  
Office of Traffic Operations**

**Prepared by:**



**January 2018**

## VERSION CONTROL

| <b>Date</b> | <b>Version</b> | <b>Description</b>                                   |
|-------------|----------------|------------------------------------------------------|
| 7/13/17     | 1.0            | DRAFT Traffic Incident Management Service Layer Plan |
| 9/15/17     | 1.1            | Revised Draft                                        |
| 10/19/17    | 1.2            | Revised Draft                                        |
| 11/21/17    | 1.3            | Revised Draft                                        |
| 1/2/18      | 1.4            | Final Draft                                          |

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## LIST OF ABBREVIATIONS

|         |                                                                    |          |                                                           |
|---------|--------------------------------------------------------------------|----------|-----------------------------------------------------------|
| AADT    | Average Annual Daily Traffic                                       | InTrans  | Institute of Transportation at Iowa State University      |
| AADTT   | Average Annual Daily Truck Traffic                                 | Iowa DOT | Iowa Department of Transportation                         |
| AAR     | After Action Review                                                | ISP      | Iowa State Patrol                                         |
| AASHTO  | American Association of State Highway and Transportation Officials | ITS      | Intelligent Transportation Systems                        |
| ATDM    | Active Transportation and Demand Management                        | IWZ      | Intelligent Work Zone                                     |
| ATMS    | Advanced Traffic Management System                                 | JOP      | Joint Operations Policy                                   |
| BTI     | Buffer Time Index                                                  | LTAP     | Local Technical Assistance Program                        |
| CAD     | Computer Aided Dispatch                                            | MAASTO   | Mid-America Association of State Transportation Officials |
| CARS    | Condition Acquisition and Reporting                                | MDST     | Multi-Disciplinary Safety Team                            |
| CARS    | Citizen Awareness on Roadway Safety                                | MOU      | Memorandum of Understanding                               |
| C/AV    | Connected and Automated Vehicle                                    | MPO      | Metropolitan Planning Organization                        |
| CCTV    | Closed Circuit Television                                          | MVE      | Iowa DOT Motor Vehicle Enforcement                        |
| CMM     | Capability Maturity Model                                          | NCHRP    | National Cooperative Highway Research Program             |
| COG     | Continuity of Government                                           | NIMS     | National Incident Management System                       |
| COOP    | Continuity of Operations                                           | NUG      | National Unified Goal for Traffic Incident Management     |
| CTRE    | Center for Transportation Research and Education                   | OCM      | Office of Construction and Materials                      |
| CVO     | Commercial Vehicle Operations System                               | OTO      | Office of Traffic Operations                              |
| DMAMPO  | Des Moines Area MPO                                                | PTI      | Planning Time Index                                       |
| DMS     | Dynamic Message Sign                                               | PSAP     | Public Service Answering Point                            |
| DOT     | Department of Transportation                                       | RFP      | Request for Proposals                                     |
| EM      | Emergency Management                                               | RWIS     | Road Weather Information System                           |
| EMS     | Emergency Medical Services                                         | SEOC     | Statewide Emergency Operations Center                     |
| ESF     | Emergency Support Function                                         | SHRP2    | 2nd Strategic Highway Research Program                    |
| FAST    | Fixing America's Surface Transportation                            | SOP      | Standard Operating Procedure                              |
| FHWA    | Federal Highway Administration                                     | TAM      | Transportation Asset Management                           |
| GLRTOC  | Great Lakes Regional Transportation Operations Coalition           | TAS      | Office of Traffic and Safety                              |
| GTSB    | Governor's Traffic Safety Bureau                                   | TCP      | Traffic Critical Projects                                 |
| HH      | Highway Helper                                                     | TIM      | Traffic Incident Management                               |
| HSEMD   | Iowa Homeland Security and Emergency Management Department         | TMAC     | Traffic Management Advisory Committee                     |
| ICE     | Interstate Condition Evaluation                                    | TMC      | Traffic Management Center                                 |
| ICE-OPS | Interstate Condition Evaluation- Operations                        | TRB      | Transportation Research Board                             |
| ICS     | Incident Command System                                            | TSMO     | Transportation Systems Management and Operations          |
| ICWS    | Intersection Collision Warning System                              | USDOT    | United States Department of Transportation                |
| ISICSB  | Iowa Statewide Interoperable Communications System Board           | VMT      | Vehicle Miles Traveled                                    |

## **PART 1. INTRODUCTION**

Transportation Systems Management and Operations (TSMO) is defined by the Moving Ahead for Progress in the 21st Century Act (MAP-21) as: *“Integrated strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system.”*

TSMO strategies are used to proactively manage the transportation system by addressing recurring and nonrecurring congestion in real time. Strategies such as traffic incident management, traveler information services, safety service patrols, work zone management and freight management improve system efficiency, enhance public safety, help reduce traveler delays and improve information access. Key to successful integration of these and other TSMO strategies are public and private agency partnerships that, when cohesive, enhance communications and collaboration among transportation partners.

### **TIM Challenges and Opportunities**

Iowa Department of Transportation’s TSMO Program Service Layers address eight focus areas for TSMO Program planning and implementation. The Traffic Incident Management (TIM) Service Layer is a critical component of the TSMO vision to provide the safe and effective management of the transportation system statewide.

Traffic incidents affect the safety of the traveling public and emergency responders at the scene of incidents. These incidents also impact the movement of goods and services on the highways and travel reliability for Iowans. Iowa’s highways experience a wide range of incidents, from minor crashes to hazardous materials spills and multi-vehicle pileups. TIM provides a systematic, coordinated approach to managing incidents on the highway system to minimize impacts to the traveling public and enhance the safety of those involved in and responding to those incidents. TIM is essential to the safety and vitality of Iowa’s communities, economy and safety, and provides significant opportunities to safely manage system operations and reliability through relatively low cost activities.

## **THE ROLE OF TRAFFIC INCIDENT MANAGEMENT IN TSMO**

Iowa DOT’s TSMO

Program Plan is a guide that helps Iowa DOT operate existing infrastructure at its optimal, full-service potential, to meet the vision for TSMO. Traffic Incident Management (TIM) supports TSMO through coordinated, safe, efficient and timely management of highway incidents.

Effective TIM requires collaboration and coordination between emergency responders, such as law enforcement, fire/rescue, towing/recovery, Iowa Department of Transportation (DOT) maintenance and operations, and local agencies. Iowa DOT is committed to enhancing the historically strong relationships between these partners and in 2015 developed a TIM Blueprint as an important initial step in implementing TIM initiatives and setting a strategic direction for the Iowa DOT TIM program as a key service of Iowa DOT's TSMO Program.

The process of developing the TIM Service Layer Plan further clarifies Iowa's commitment to implementing a number of aspects of the National Unified Goal (NUG) for TIM which will ultimately achieve enhanced responder safety; safe, quick traffic incident clearance; and more prompt, reliable, interoperable communications.

### TIM Goals and Objectives

The TIM Service Layer Plan is a critical component of Iowa DOT's TSMO Program. The TSMO Program Plan identified strategic goals and objectives as well as programmatic goals and objectives. The TIM Service Layer supports both the strategic and programmatic goals and objectives of the Iowa DOT. It establishes specific objectives to guide the day-to-day activities, prioritize projects and services, and establish performance-based management of TIM activities in Iowa.

Table 1 shows the TSMO strategic goals and objectives for Iowa DOT. Table 2 shows the programmatic objectives identified for performance monitoring within the TIM Service Layer. Further consideration for the TIM Service Layer identifies more specific objectives to support the program objectives and the TSMO strategic objectives. Iowa DOT staff and key TIM partners identified service layer objectives, also shown in Table 2. These objectives reflect key components of successful TIM plans identified in Federal Highway Administration's (FHWA) *Traffic Incident Management Gap Analysis Primer*. In addition, Iowa DOT is committed to adopting the NUG for TIM, which crosscuts safety, reliability, efficiency, coordination and integration.

TABLE 1. STRATEGIC GOALS AND OBJECTIVES












| Strategic Goal                                                                                             | Strategic Objective                                                                                                                |  |
|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--|
|  1. <i>Safety</i>       | Reduce crash frequency and severity                                                                                                |  |
|  2. <i>Reliability</i>  | Improve transportation system reliability, increase system resiliency, and add highway capacity in critical corridors              |  |
|  3. <i>Efficiency</i>   | Minimize traffic delay and maximize transportation system efficiency to keep traffic moving                                        |  |
|  4. <i>Convenience</i>  | Provide ease of access and mobility choices to customers                                                                           |  |
|  5. <i>Coordination</i> | Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system    |  |
|  6. <i>Integration</i>  | Incorporate TSMO strategies throughout DOT's transportation planning, design, construction, maintenance, and operations activities |  |

TABLE 2. TIM SERVICE LAYER OBJECTIVES

| Goal                                                                                              | Strategic Objective                                                                                                             | Program Objective                                                                                                                                                                                                | Service Layer Objectives                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Safety       | Reduce crash frequency and severity                                                                                             | <ul style="list-style-type: none"> <li>Reduce the number of secondary crashes caused by traffic incidents</li> </ul>                                                                                             | <ul style="list-style-type: none"> <li>Reduce secondary crashes</li> <li>Improve patient outcomes</li> </ul>                                                                                                            |
| <br>Reliability  | Improve transportation reliability, increase system resiliency, and highway capacity in critical corridors                      |                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>Respond quickly to incidents</li> <li>Clear incidents quickly</li> </ul>                                                                                                         |
| <br>Efficiency   | Minimize traffic delay and maximize system efficiency to keep traffic moving                                                    | <ul style="list-style-type: none"> <li>Respond to and clear traffic incidents as quickly as possible</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>Respond quickly to incidents</li> <li>Clear incidents quickly</li> </ul>                                                                                                         |
| <br>Convenience  | Provide ease of access and mobility choices to customers                                                                        | <ul style="list-style-type: none"> <li>No unplanned road closures or restrictions due to conditions within Iowa DOT's control</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>Provide real-time information on incidents and alternative routes</li> </ul>                                                                                                     |
| <br>Coordination | Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system | <ul style="list-style-type: none"> <li>Lead Statewide and Regional Traffic Incident Management Program activities</li> <li>Coordinate responses to large scale traffic incidents with adjacent states</li> </ul> | <ul style="list-style-type: none"> <li>Enhance TIM multiagency coordination</li> <li>Support TIM through interoperability</li> <li>Coordinate response to large scale traffic incidents with adjacent states</li> </ul> |

The following sections describe each service layer objective in Table 2.

### REDUCE SECONDARY CRASHES

The potential for secondary crashes increases as the time required to respond to and clear incidents increases; and secondary crashes can be more severe than the initial incident. For example, the initial incident may be debris falling from a truck or a flat tire, creating an unexpected hazard or traffic congestion. Secondary crashes may also involve responders, either in vehicles or working on the scene. It is critical for the safety of the traveling public and incident responders to quickly respond to and clear incidents, and to manage scenes to minimize the occurrence of secondary crashes.

### IMPROVE PATIENT OUTCOME

Patient outcome depends on the timely response of emergency medical resources and the ability to transport patients to appropriate receiving facilities. Faster response times, rapid care and timely transport are the major contributing factors to improved patient outcomes.

### RESPOND QUICKLY TO INCIDENTS

Quick response to incidents improves the safety of travelers and patients by providing resources to manage the incident and associated traffic impacts.

### CLEAR INCIDENTS QUICKLY

Quick clearance minimizes the impact of an incident on the efficiency and reliability of the transportation system, and supports traveler convenience and the movement of goods on Iowa highways. Safe, Quick Clearance is also one of the cornerstone objectives of the NUG for TIM.

## **PROVIDE REAL-TIME INFORMATION ON INCIDENTS AND ALTERNATIVE ROUTES**

Good communications between responders and the Traffic Management Centers (TMCs) and other centers is critical for effective response. The dialogue between the TMC and the responders (either directly or indirectly through respective dispatch) is the way that incidents are identified, responder resources are dispatched and incident details are captured. This flow of information enables creation of accurate real-time traveler information which is essential to minimizing the impact to the traveling public and improving safety to motorists and incident responders. This also facilitates real-time travel time estimates associated with incidents to enhance convenience and system efficiency by allowing travelers to make informed decisions about travel decisions (e.g., divert or wait).

## **ENHANCE TIM MULTIAGENCY COORDINATION**

Multiagency coordination is essential to effective TIM. Coordination between Iowa DOT, law enforcement, fire/rescue, medical response, towing and recovery, and others is a key piece of the Iowa TIM program. The NUG also recommends state, regional and local level partners should work together to promote, develop, and sustain effective TIM Programs.

## **SUPPORT TIM THROUGH INTEROPERABILITY**

Interoperable communications between agencies during an incident is vital to a coordinated, safe and efficient scene. Additionally, data interoperability and video feeds are critical resources for planning for and responding to traffic incidents. Multiagency data sharing supports resource management and enhances coordinated response. One of the major objectives of the NUG includes prompt, reliable incident communications.

## **COORDINATE RESPONSE TO LARGE SCALE TRAFFIC INCIDENTS WITH ADJACENT STATES**

Large scale incidents impact interstate travel and commerce, creating delays to the movement of goods and people across state lines. Enhanced coordination and cooperation with adjacent states support safety, reliability, convenience and commerce through shared resources and information.

## Relationship with other TSMO Service Layer Plans

With several other Service Layer Plans under development or planned to be completed over the next two years, Figure 1 illustrates how the TIM Service Layer Plan relates to the seven other plans.

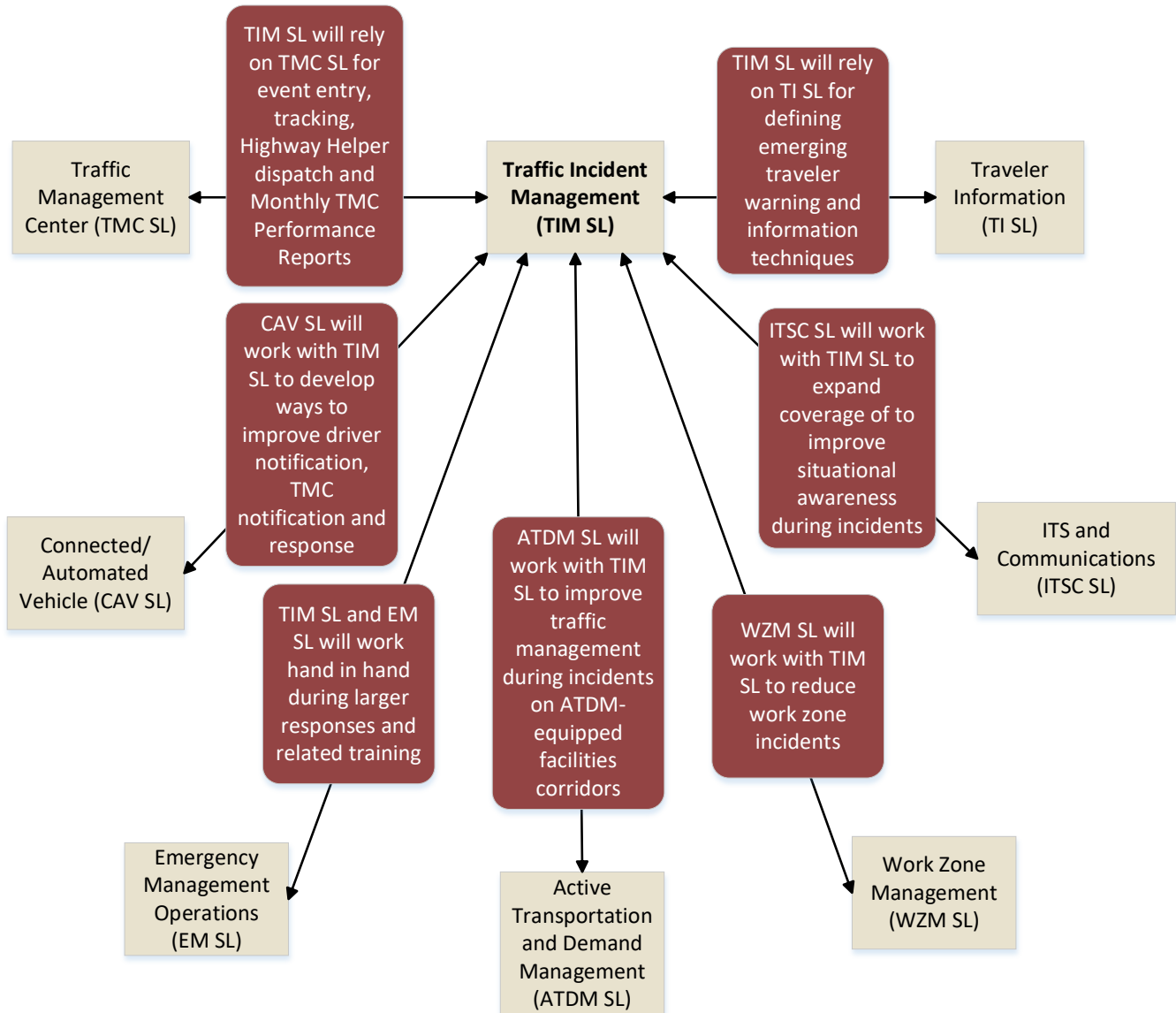


FIGURE 1. TIM SERVICE LAYER PLAN RELATIONSHIPS



## Report Organization

As recommended in the TSMO Program Plan, each service layer includes the same basic framework.

- **Part 1-Introduction** – Includes opportunities and challenges, builds on TSMO Plan Goals, Strategic/Program Objectives, defines the specific Service Layer Objectives; which sets the stage for the rest of the report.
- **Part 2-Description of Existing Services, Activities and Projects** – Provides a detailed description of existing services, activities and projects.
- **Part 3-Existing Conditions** – An assessment of related existing conditions based on several outcomes-based analysis tools that are being used by Iowa DOT.
- **Part 4-TIM Program Assessment** – Includes gap analysis and rolled up results from the 2016 TIM Self-Assessment.
- **Part 5-Performance Management** – Defines specific measures for each Service Layer Objective.
- **Part 6-5-Year Action Recommendations** – Provides a list of actionable recommendations by Fiscal Year that may not necessarily have a budget impact.
- **Part 7-5-Year Service Layer Cost Estimate** – A detailed cost estimate by fiscal year that will be used to refine the TSMO Program Plan budget estimates.

## PART 2. CURRENT SERVICES, ACTIVITIES AND PROJECTS

### Current TIM Roles and Responsibilities

Iowa DOT and its partners have developed a strong foundation for TIM activities around the state. To help define current services, activities and projects, a description of TIM partner roles and responsibilities are described to better understand where the specific partners fit into the lifecycle of a typical traffic incident. Figure 2 shows the typical timeline of a traffic incident and Table 3 describes agency responses during various times of the incident. Following that, more details are provided for Iowa DOT services, activities and projects.

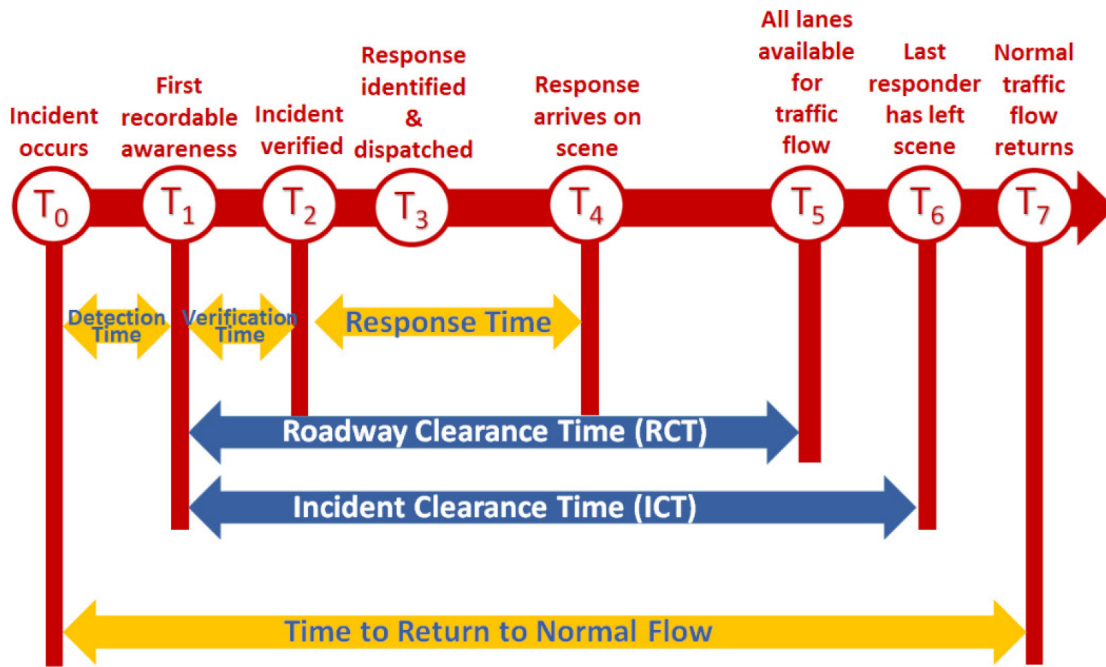


FIGURE 2. TYPICAL TRAFFIC INCIDENT TIMELINE  
Source: NCHRP 07-20, Guidance for Implementation of TIM Performance Measurement

TABLE 3. TYPICAL TIM RESPONSIBILITIES IN IOWA

| Time                            | Activity                                                                                                                                                                                | Lead TIM Partner                                                                                                                                                                                                                                                                                                            | Supporting Partners                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| T <sub>0</sub> – T <sub>1</sub> | Time between the incident occurring and the incident being reported. Detection time is not typically reported due the fact that the actual time the incident occurred is often unknown. | There are over 115 public safety answering points (PSAP) across 99 counties that handle both landline and wireless 911 calls. Most traffic incidents are reported via a wireless 911 call initially received by Iowa State Patrol (ISP).                                                                                    | Where there is detection coverage, the Iowa DOT TMC has the capability to sense changes in average speeds, indicative of a traffic incident.                                                                                                                                                                                                         |
| T <sub>1</sub> – T <sub>2</sub> | Time between incident being reported and the incident being verified.                                                                                                                   | Many times, the PSAP verifies a traffic incident via multiple calls for the same incident.                                                                                                                                                                                                                                  | The Iowa TMC assists with verification through use of their closed circuit television (CCTV) cameras network.                                                                                                                                                                                                                                        |
| T <sub>2</sub> – T <sub>3</sub> | Time between incident being verified and initial resources being dispatched.                                                                                                            | Law enforcement plays a predominant role as the first responder to arrive at the scene. ISP plays the most significant and active role in responding to incidents on the primary highway network.                                                                                                                           | The TMC starts placing information on dynamic message signs (DMS), 511, etc.                                                                                                                                                                                                                                                                         |
| T <sub>3</sub> – T <sub>4</sub> | Time between the initial dispatching of resource and the first responder arriving on scene.                                                                                             | Law enforcement (ISP or county sheriff) is the predominant first responder to arrive the scene.                                                                                                                                                                                                                             | Iowa DOT Highway Helper vehicles may be the first responder arriving at the scene depending on location and availability of law enforcement                                                                                                                                                                                                          |
| T <sub>4</sub> – T <sub>5</sub> | Time of major activity at the incident scene and when lanes are open to traffic.                                                                                                        | A number of agencies will often be on site including law enforcement, fire/emergency medical services (EMS), towing/recovery. In the event of fire, injury, or other life safety incidents, fire/rescue is generally in command of the scene. Regardless of the situation, incident command is used for incident responses. | Highway Helper helps provide traffic control when possible. When fatalities are involved, the county coroner is dispatched to the scene. For severe injuries, helicopter-based transport may require clearance for landing area. For large scale incidents, Iowa Depending on the situation, DOT Maintenance will also be used to provide resources. |
| T <sub>5</sub> – T <sub>6</sub> | Time from when all lane open, but activity may remain on the shoulder until the time all activity leaves the roadside.                                                                  | Towing/recovery and law enforcement are typically the last two remaining entities on the shoulder.                                                                                                                                                                                                                          | Highway Helper or other DOT resources provide advanced warning of vehicles positioned on shoulder.                                                                                                                                                                                                                                                   |
| T <sub>6</sub> – T <sub>7</sub> | Time from when all activity leaves the incident site to traffic returning to normal conditions.                                                                                         | Where possible, the TMC monitors traffic as the queue dissipates and clears applicable messaging when back to typical operations.                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                      |

### Highway Helper Freeway Service Patrols

Currently there are three areas in the state that employ Highway Helper Freeway Service Patrols to assist with a variety of TIM activities. Highway Helper’s primary role is to remove traffic disruptions

quickly to prevent secondary crashes. The three areas in the state that include Highway Helper service are highlighted in Table 4. Highway Helper Locations.

TABLE 4. HIGHWAY HELPER LOCATIONS

| Highway Helper Location | Patrol Routes                                                                                                                                                                                                                                                                                                                 | On-Call Routes                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Des Moines              | <p>TOTAL MILES: 50</p> <ul style="list-style-type: none"> <li>I-80 from Jordan Creek Parkway (MP 121) to US 65 (MP 141)</li> <li>I-35 from Grand Avenue (MP69) to NW 36th St Ankeny (MP 94)</li> <li>US 65 from Highway #163 (MP79) to I80 (MP 84)</li> <li>All of I-235</li> </ul>                                           | <p>TOTAL MILES: 22</p> <ul style="list-style-type: none"> <li>I-35 Cumming (MP65) to Grand Avenue (MP69)</li> <li>I-35 NW 36th Ankeny (MP94) to Us 30 Ames (MP111)</li> <li>I-80 Altoona (MP142) to Bondurant (MP143)</li> </ul>                                                                                                                 |
| Cedar Rapids/Iowa City  | <p>TOTAL MILES: 43</p> <ul style="list-style-type: none"> <li>I-380 (MP 0) from I-80/US 218 to Boyson Road (MP 25)</li> <li>US 30 from US 151/Williams Blvd (MP 248) to "C" Street (MP 254)</li> <li>I-80 from Tiffin (MP237) to Iowa 1 (MP 246)</li> <li>US 218 from Melrose Avenue (MP 93) to I-80/I-380 (MP 96)</li> </ul> | <p>TOTAL MILES: 10</p> <ul style="list-style-type: none"> <li>I-80 from Iowa 1 (MP 246) to Herbert Hoover Highway (MP 249)</li> <li>US 218 from Iowa 1 (MP 91) to Melrose Avenue (MP 93)</li> <li>I-380 from Boyson Road (MP 25) to County Home road (MP28)</li> <li>US 30 from 16th Avenue (MP 246) to US 151 Williams Blvd (MP 248)</li> </ul> |
| Council Bluffs          | <p>TOTAL MILES: 16</p> <ul style="list-style-type: none"> <li>I-29 from US 275 (MP47) to 25th St. (MP55)</li> <li>I-80 from 13th St. (Ne MP 454) to Madison Avenue (MP 5)</li> <li>I-480 from US 6 Dodge St. (NE) to I-29 ( MP 53B)</li> </ul>                                                                                | <p>TOTAL MILES: 14</p> <ul style="list-style-type: none"> <li>I-29 from Iowa 340 (MP 42) to US 275 (MP 47)</li> <li>I-29 from 25th St. (MP 55 ) to Iowa 192 (MP 56)</li> <li>I-29 from Iowa 192 (MP 55) to South I-29/I-680 (MP 61)</li> <li>I-80 from Madison Avenue ( MP 5) to US 6 (MP8)</li> </ul>                                           |

Each location uses two customized one-ton pickup trucks with Highway Helper markings, shown in Figure 3, that operate during the hours of 6 AM-7 PM. On occasion, hours are added to cover holidays, high volume travel time periods, and special events. As needs grow for additional services, patrol routes are currently being evaluated based on data the Center for Transportation Research and Education (CTRE) is helping to analyze.



FIGURE 3. HIGHWAY HELPER FREEWAY SERVICE PATROL

## TMC and Its Role in TIM

Located in the lower level of Iowa DOT's Ankeny Motor Vehicle Division Building, the TMC, shown in Figure 4, is the hub for the following 24/7 real-time TIM activities:

- Identify crash locations
- Dispatch Highway Helper freeway service patrols
- Coordinate response actions with ISP, sheriff's departments, Maintenance, and others
- Provide information on 511, DMS and highway advisory radio
- Populate the advanced traffic management software with specific incident response information
- Serve as a focal point for highway related emergency management activities
- Generates Monthly and Annual TMC Performance Reports



FIGURE 4. IOWA DOT TRAFFIC MANAGEMENT CENTER

## Special Event Coordination

Iowa DOT plays an active role in supporting major special events that impact the state highway network. Some of the events that require special planning and coordination with Iowa DOT and other TIM partners include:

- Iowa State football games
- University of Iowa football games
- Iowa State Fair
- Farm Technology Days
- NCAA Basketball Tournaments



## After Action Reviews (AARs)

The Iowa DOT helps facilitate a number of AARs to review what went well and identify areas of opportunity for improving response to and management of traffic incidents. Over the course of 2016, Iowa DOT planned and facilitated over a dozen AARs.

## SHRP 2 Emergency Responder Training

Iowa DOT, in partnership with the Fire Training Service Bureau, has provided 2nd Strategic Highway Research Program (SHRP2) Emergency Responder Training to nearly 3,000 of its estimated 30,000 responders. 96 individuals in Iowa have completed the FHWA Train-the-Trainer Training; however, there are only about a half-dozen active trainers in the state. FHWA established a goal of training 20% of each state's emergency responders. Figure 5 shows how states compare to one another in percent of responders trained.

# TIM Training Program Implementation Progress Percent Trained – SIP 17 Goal of 20% - As of October 2, 2017

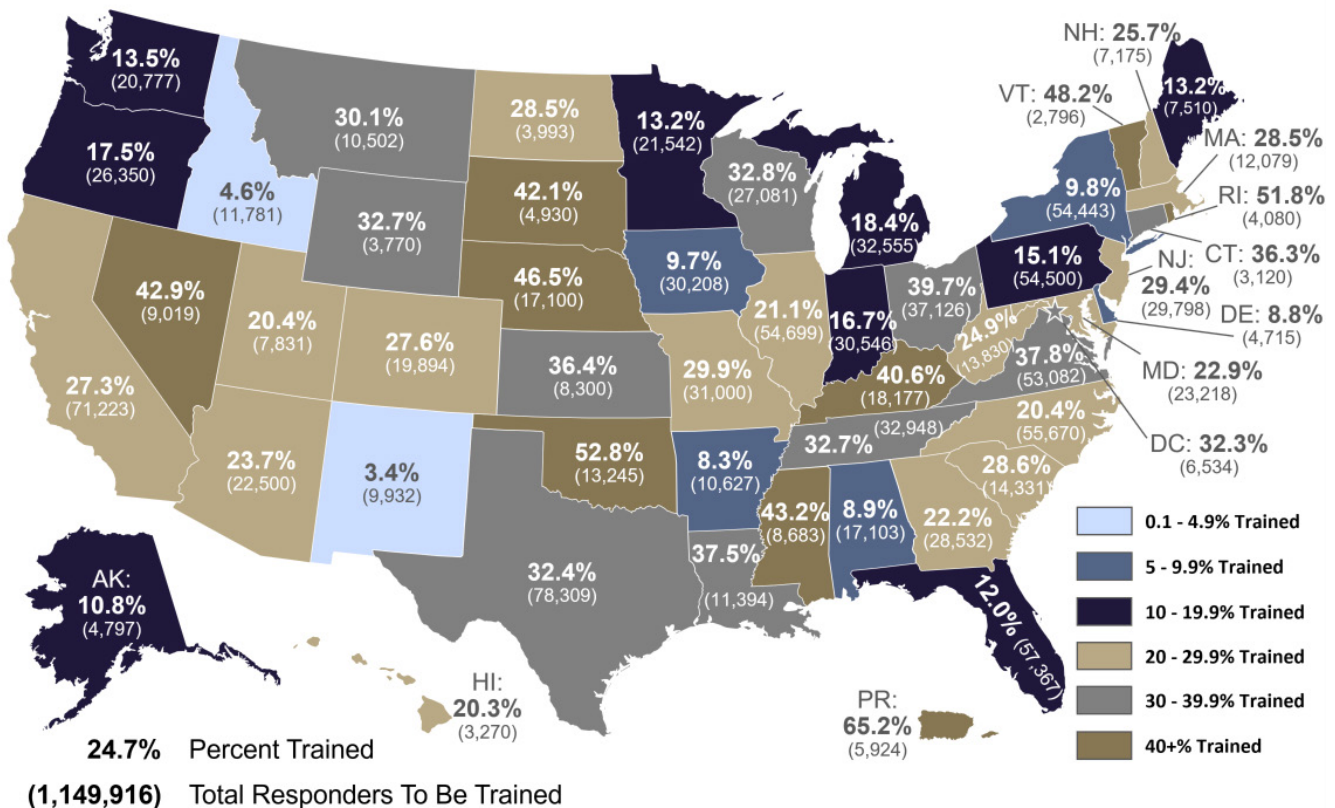


FIGURE 5. SHRP2 TRAINING STATISTICS

## Tabletop Exercises

The Iowa DOT plans and leads discussion at about 6-8 tabletop exercises each year throughout the state. The tabletop exercises are used to clarify roles and responsibilities and to identify additional emergency management mitigation and preparedness needs. Each exercise includes representatives from fire, ISP, police, sheriff's department, EMS, local emergency management, towing, county highways, municipal public works, school transportation, as well as local DOT. Figure 6 shows a tabletop exercise at Le Mars.



FIGURE 6. TABLETOP EXERCISE

## TIM Plans

A number of TIM plans have been developed around the state, primarily to help manage large scale traffic incidents. Table 5 highlights the locations with TIM plans, the last known update, and key stakeholders.

TABLE 5. TRAFFIC INCIDENT MANAGEMENT PLAN STATUS

| TIM Plan              | Last Update       | Key Stakeholders                                                                                                                                         |
|-----------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cedar Rapids          | 2014              | Iowa DOT, ISP, City of Cedar Rapids, Linn County                                                                                                         |
| Council Bluffs/Omaha  | 2016              | Iowa DOT, ISP, City of Council Bluffs, City of Omaha (NE), Nebraska Department of Roads, Nebraska State Patrol, Metropolitan Area Planning Agency (MAPA) |
| Davenport/Quad Cities | 2012              | Iowa DOT, ISP, City of Davenport, City of Bettendorf, City of Moline (IL), Illinois DOT, Illinois State Police, City of Rock Island (IL)                 |
| Des Moines            | 2015              | Iowa DOT, ISP, City of Des Moines, City of West Des Moines, City of Ankeny, Des Moines Area MPO (DMAMPO)                                                 |
| Dubuque               | 2003              | City of Dubuque, East Central Intergovernmental Association, Dubuque County Sheriff's Dept.                                                              |
| Iowa City             | 2012              | Iowa DOT, ISP, City of Iowa City, City of Coralville, Johnson County                                                                                     |
| Sioux City            | 2015              | Iowa DOT, ISP, South Dakota DOT, Nebraska Department of Roads, City of Sioux City, City of South Sioux City (NE)                                         |
| Waterloo              | 2012              | Iowa DOT, ISP, City of Waterloo, Iowa Northland Council of Governments                                                                                   |
| Interstate            | Under development | Iowa DOT, ISP                                                                                                                                            |

Figure 7 includes sample pages from a TIM plan with information on diversion routing for an incident related closure. The next area planned for TIM plans is critical border bridges.

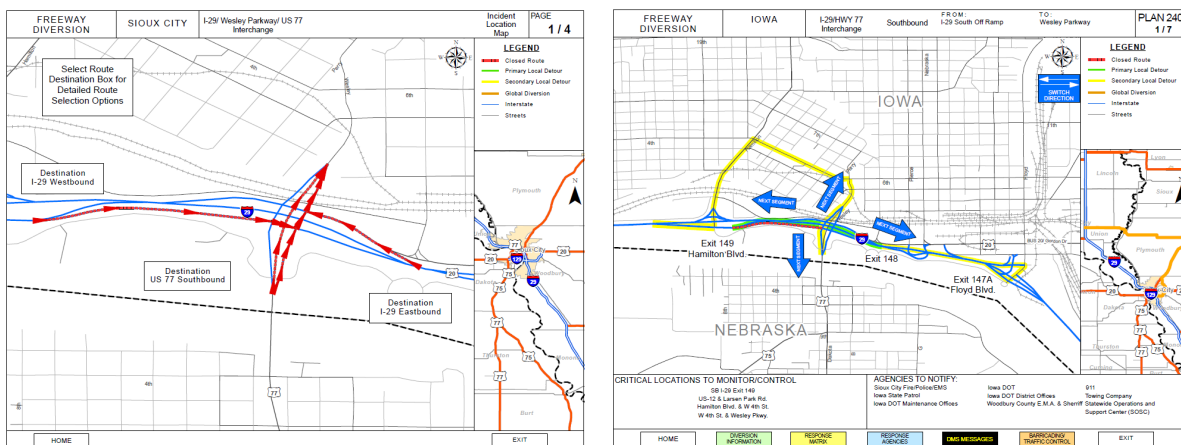


FIGURE 7. SAMPLE TIM PLAN SHEETS



## Traffic Critical Projects

The Iowa DOT Traffic Critical Projects (TCP) program identifies key construction projects across the state that may cause significant safety or mobility issues to the traveling public. Using various mitigation methods, the TCP program works to reduce or eliminate any potential safety or mobility concerns.

The TCP program supplements typical traffic control plans and is intended to reduce crashes and keep traffic flowing. The TCP program accomplishes these goals through construction projects which provide real-time work zone traffic performance information and address traffic incident management planning needs on Iowa's highest demand roadways.

The TCP program systematically analyzes proposed work zones and assesses whether a number of mitigation strategies are employed:

- Intelligent Work Zones (IWZ)
- Work Zone TIM plans
- Work Day Restrictions (Day of Week / Seasonal)
- Night Work / Limited Work Hours
- Innovative Contract Provisions such as Lane Rental

Iowa DOT is in its fourth year of the program with expanded use each year. A Policies and Procedures Manual section is very close to being approved to help institutionalize associated TCP business processes.

## TIM Blueprint

Finalized in 2015, the TIM Blueprint represents the collaboration essential to the early development and implementation of a TIM program in Iowa. Designed to address the needs identified through a number of workshops, it developed a strategic action plan to help prioritize early TIM efforts, projects and initiatives, prior to completion of this report. The complete TIM Blueprint is shown in Appendix A. Traffic Incident Management Blueprint

The TIM Blueprint represents cross-cutting needs faced by TIM practitioners across the state of Iowa. The analysis of conversations that took place in the TIM workshops resulted in six overarching program areas:

- Legislation
- Organization
- Communication and coordination
- Practitioner capacity building
- Driver education and public outreach
- Technology and institutional agreements to support partnerships

The TIM Service Layer Plan supports the TSMO Program in areas related to TIM by building on the TIM Blueprint through the clarification of service layer objectives, performance management, resource needs, staffing recommendations, and a five-year plan for TIM services and projects. Many of the recommendations have been, or in the process of being implemented as indicated by the check mark in Table 6. TIM Blueprint Recommended Actions (2015)

TABLE 6. TIM BLUEPRINT RECOMMENDED ACTIONS (2015)

| Category                                | Recommendation                                                                                                        | Yes<br>(✓) |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------|
| Legislation                             | Towing and recovery personnel qualifications                                                                          |            |
|                                         | Steer it/clear it                                                                                                     | ✓          |
| Organization                            | Statewide TIM Technical Working Group                                                                                 | ✓          |
|                                         | Multi-disciplinary open roads policy                                                                                  |            |
|                                         | Standardized approach to crash scene investigation in partnership with Iowa Association of County Medical Examiners   |            |
|                                         | Measure and report incident duration, incident clearance, and secondary crashes on freeways                           | ✓          |
|                                         | Track emergency responder and highway worker struck-by and near-miss incidents                                        |            |
| Communication and Coordination          | Establish multi-disciplinary TIM steering committees in each region through Multi-Disciplinary Safety Teams (MDSTs)   | ✓          |
|                                         | Conduct annual TIM conference                                                                                         | ✓          |
|                                         | Develop regional and TCP TIM diversion plans                                                                          | ✓          |
|                                         | Create TMC concept of operations and inter-governmental agreements to integrate traffic signal control during events  |            |
|                                         | Address TIM in TCP development process                                                                                | ✓          |
|                                         | Create online TIM credential-controlled and uncontrolled information to program members                               |            |
|                                         | Highlight value of continuous communication                                                                           |            |
|                                         | Create statewide TIM plan for continuity for all regions with emphasis on interstate corridors                        | ✓          |
| Practitioner Capacity Building          | Participate nationally to develop TIM Incident Command School                                                         |            |
|                                         | Develop grant program to pay TIM instructors in partnership with Iowa State Local Technical Assistance Program (LTAP) |            |
|                                         | Partner with Iowa State to host and maintain statewide TIM training database – <i>currently done by Iowa DOT</i>      | ✓          |
| Driver Education and Public Outreach    | Evaluate feasibility of including TIM-focused laws in driver education curriculum                                     |            |
|                                         | Implement outreach campaign with auto clubs in conjunction with SHSP and Toward Zero Death initiatives                |            |
|                                         | Provide timely and accurate incident information through 511 system                                                   | ✓          |
| Technology and Institutional Agreements | Partner with ISP to merge incident data                                                                               |            |
|                                         | Implement priority TIM corridor program that focuses on arterial diversion routes                                     |            |
|                                         | Develop framework to gather and analyze data from emergency response partners                                         |            |
|                                         | Develop smartphone app as future TIM dashboard for communication with emergency responders                            |            |
|                                         | Create inventory of crash investigation techniques for freeways and designated alternate routes                       |            |

## Annual TIM Conference

The third annual TIM Conference was held 2017, with about 300 in attendance. The conferences presented a variety of national and local speakers and received very positive feedback from participants. The recently formed Statewide TIM Committee was instrumental in planning the 2017 conference. The frequency will likely be changed to every 18 months to allow for extra planning time to make the event even better. Therefore, the next TIM Conference will tentatively be held in spring 2019.

## Statewide TIM Committee

The Statewide TIM Committee was formed in September 2016 to coordinate a wide range of safety and mobility issues related to TIM. Figure 8 shows a picture from the inaugural meeting held in Ankeny in September 2016.



FIGURE 8. STATEWIDE TIM COMMITTEE

The vision, mission, and goals of the committee are included below.

### VISION

Iowa public and private stakeholders join together to improve safety related to the management of response and clearance of all types of roadway incidents.

### MISSION

Serve as a voice and clearinghouse to establish safe, consistent statewide response and clearance practices.

### GOALS

- Endorse and work towards the NUG
- Establish and promote Quick Clearance Targets

- Promote Emergency Responder TIM Training
- Plan and convene TIM Awareness Events
- Formally “connect” with Regional MDSTs
- Support TIM legislation and policies

A number of small task forces have been formed to address specific issues. The three most recently formed include Secondary Crash Data, TIM Training, and 2017 Annual TIM Conference.

The group is currently investigating creation of a 501(c)(3) non-profit organization to allow for flexibility in collecting registration fees and donations to help provide small stipends for volunteer trainers and possible even small incentives to get volunteer fire departments to participate (e.g., cones, high visibility clothing, etc.).

### **Multi-Disciplinary Safety Teams (MDSTs)**

There are a number of MDSTs that meet routinely across the state. The original intent of the MDSTs was to bring together a broad audience to discuss traffic safety issues. Over time, TIM topics have been integrated into the discussion at long standing MDSTs while TIM has been the foundational reason for forming additional groups:

- Cedar Rapids – Linn County MDST
- Omaha-Council Bluffs - TIM Working Group and Executive Committee
- Davenport/Quad Cities - Citizen Awareness on Roadway Safety (CARS) Group
- Des Moines - Polk County MDST and Traffic Management Advisory Committee (TMAC)
- Dubuque - Dubuque County MDST
- Iowa City - Johnson County MDST
- Sioux City - Tri-State TIM Group
- Waterloo - Currently re-establishing MDST
- Fort Dodge - Fort Dodge MDST
- Ottumwa - Ottumwa MDST
- Clinton - Clinton County MDST
- Mason City - North Iowa MDST

Recently, the LTAP Center at CTRE was contracted by Iowa DOT to help with coordination across the MDSTs. It is anticipated that common TIM issues discussed at MDSTs will ultimately be pushed up to the Statewide TIM Committee.

### **Multi-State Coordination**

Iowa DOT is a partner in several operations-oriented, multi-state initiatives:

- Great Lakes Regional Transportation Operations Coalition (GLRTOC) - GLRTOC is a partnership of Great Lakes agencies that collaborates on initiatives that improve cross-regional transportation operations in support of regional economic competitiveness and improved quality of life. This mega

region transportation approach addresses the challenges related to traffic congestion and an aging infrastructure on a large-scale, collective and consensus basis. In addition to Iowa DOT, the members of the coalition include:

- Illinois DOT
  - Illinois State Toll Highway Authority
  - Indiana DOT
  - Indiana Toll Road Concession Company
  - Kansas DOT
  - Kentucky Transportation Cabinet
  - Michigan DOT
  - Ministry of Transportation Ontario
  - Minnesota DOT
  - Missouri DOT
  - Ohio DOT
  - Skyway Concession Company
  - Wisconsin Department of Transportation
- ITS Heartland - The ITS Heartland Chapter of ITS America is intended to facilitate information sharing for Intelligent Transportation Systems (ITS) projects and activities and to showcase ITS applications in five heartland states, Missouri, Iowa, Kansas, Nebraska and Oklahoma. To date, all five state departments of transportation, along with major universities in each state and the Federal Highway Administration have been involved in developing the organization. In 2014, the ITS Heartland Chapter was awarded a Multistate Corridor Operations and Management Program by FHWA to fund two projects aimed at providing greater information sharing between the five state transportation agencies and their respective customers. The two projects included providing real-time data on rural freeways and testing a regional ATIS clearinghouse/data aggregator.
  - Mid-America Freight Coalition - The Mid-America Freight Coalition is a regional organization that cooperates in the planning, operation, preservation, and improvement of transportation infrastructure in the Midwest. The ten states of the American Association of State Highway and Transportation Officials' (AASHTO) Mid-America Association of State Transportation Officials (MAASTO) share key interstate corridors, inland waterways, and the Great Lakes.

## **TIM-Related Research**

CTRE is supporting a variety of TIM related research including:

- Highway Helper Route Analysis – Determining if routes need to be adjusted and/or if additional vehicles would assist in improving safety and mobility.
- MDST Program Support – While not directly related to research, the LTAP at CTRE is assisting in the coordination of MDSTs around the state. The MDST Program is a coordinated effort between Iowa LTAP, Iowa DOT and the Iowa Governor's Traffic Safety Bureau. This joint effort supports the opportunity to help facilitate the development and operation of local multi-discipline safety teams to help identify and resolve local crash causes and enhance crash response practices. The teams include a wide range of local and state safety participants from various backgrounds. Each MDST meets on a regular basis to discuss safety topics, problems, projects, and improvements along local roadways within regional areas of Iowa.

## Other TIM Related Activities

Iowa DOT is involved with several other TIM related activities as described below:

- *Using Data to Improve Traffic Incident Management/ Every Day Counts Program* - FHWA is encouraging adoption of three national TIM performance measures—time of lane closure, time responders are on-scene, and number of secondary accidents—that agencies can focus on in data collection and reporting. The three measures will provide a baseline for comparing TIM program assessments across state and regional boundaries. Iowa is a lead state and recently hosted a workshop to learn how Arizona DOT has adopted TIM Performance Measures.
- *TraumaHawk* – a mobile application that allows law enforcement to send pictures from the scene of a crash to the University of Iowa Hospital emergency rooms. Iowa DOT provided the pilot funding for the application. Thirty five ISP troopers throughout eastern Iowa currently use TraumaHawk. Research data has found that without TraumaHawk ER personnel had an average of 12 minutes lead time and with it preparation time expands to about 26 minutes.
- *TIM Training Facility* – Iowa DOT is in the preliminary stages of developing a multidisciplinary TIM Training Facility to allow for closed circuit training on various types of transportation facilities. A location has been identified near Newton and funding alternatives are being explored.



## PART 3. EXISTING CONDITIONS

### Iowa Specific Sources of Congestion

Iowans experience a variety of mobility challenges every day. The most significant of these challenges are temporary disruptions that take away part or the roadway from use and cause “non-recurring” congestion, primarily including bad weather, traffic incidents, and work zones, as shown Figure 9. In fact, about 72% of the congestion and delay experienced by the traveling public in Iowa is non-recurring congestion.

The impact of congestion goes well beyond a traffic event. In calendar year 2016, there was an average of over 2,000 traffic incidents per month statewide, with an average duration of approximately 53 minutes for blocked lanes. Each minute a lane is blocked can lead to 4-5 minutes of delay, and for each minute that a primary incident continues, the likelihood of a secondary crash increases by 2.8%. USDOT estimates that secondary crashes represent more than 20% of all crashes and are often more deadly than the primary incident. Fewer incidents and quicker clearance of incidents help to reduce congestion, allowing the transportation system to operate more safely and efficiently.

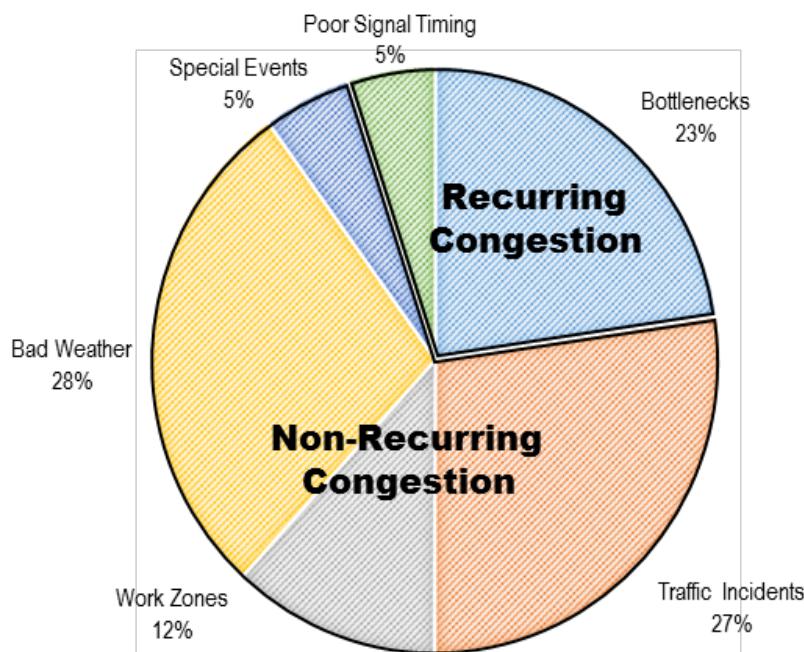


FIGURE 9. TYPES OF CONGESTION IN IOWA

For the purposes of the statewide highway network, there are several sources of detailed information that help illustrate existing conditions:

- 1) **The Interstate Condition Evaluation for Operations (ICE-OPS)** – a tool developed in coordination with the Office of Systems Planning meant to evaluate which corridors have

operational challenges based upon nine different operations-oriented criteria. Ultimately, this information can be used to help prioritize investments in the Interstate system.

- 2) **Interstate Congestion Report** – Completed in coordination with CTRE at Iowa State University, highlights the measured highway performance on a statewide basis. Intended to be coordinated in the future with ICE-OPS.
- 3) **Monthly and Annual TMC Reports** – Provides a summary of activities and observations from the Iowa DOT Traffic Management Center
- 4) **Annual TCP Report** – Completed in coordination with CTRE at Iowa State University, summarized performance at the highway work zone equipped with monitoring technology

In addition to summaries of these sources, other existing conditions information is presented below.

### **ICE-OPS Network Assessment Tool**

Early in the development of the TSMO Program, the need to develop a screening tool to support data-driven decisions on where to apply limited resources was identified. The ICE-OPS tool was developed in conjunction with the Office of Systems Planning based upon the Interstate Corridor Plan that uses condition data and spatial analytics to determine which Interstate corridors should be considered priorities for infrastructure renewal, a methodology called the Interstate Condition Evaluation (ICE). The Office of Traffic Operations (OTO) worked with Systems Planning to develop a parallel ICE-OPS methodology that uses similar normalization, weighting structure and composite scoring techniques to compare 21 Interstate corridors as initially defined by the Interstate Corridor Plan.

The ICE-OPS tool is meant to evaluate which corridors have operational challenges based upon nine different operations-oriented criteria. Ultimately, this information can be used to help prioritize TSMO investments.

Raw data from each criterion is maintained in an Excel table and summarized in a final output table through the use of Structure Query Language (SQL). Each criterion contributes to a segment level composite ICE-OPS score out of 100. Higher scores mean fewer operational challenges. The composite scores on the segments that made up the defined corridors were weighted by length and averaged for each. The nine operations-oriented criteria include:

- All Bottleneck Occurrences per Mile
- Freight Bottleneck Occurrences per Mile
- Traffic Incident Frequency
- Crash Rate
- Buffer Time Index
- Event Center Buffer Mileage
- Weather Sensitive Corridor Mileage
- Total average annual daily traffic (AADT)
- ICE Rating
- Weighted average of all-Composite Score



Figure 10 illustrates the composite map-based output from ICE-OPS. Grey circles have been superimposed on the original map to draw attention to the areas that require attention. Table 7 lists the top 20 corridor segments identified as operationally sensitive from the ICE-OPS data.

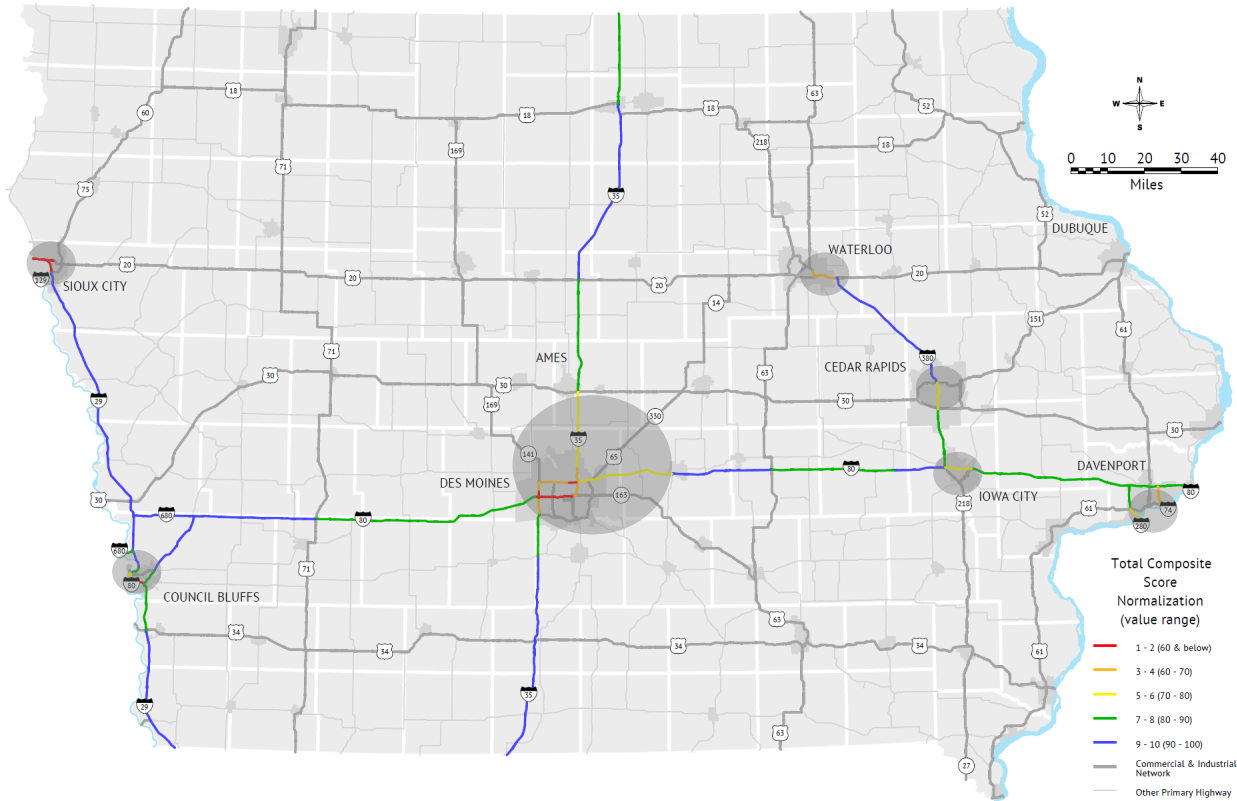


FIGURE 10. 2016 ICE-OPS TOTAL COMPOSITE SCORE

TABLE 7. 2016 ICE-OPS TOP 20 OPERATIONALLY SENSITIVE CORRIDORS

| Corridor Name                                    | Length (mi) | All Bottlenecks per mile (10%) | Freight Bottlenecks per mile (10%) | Incident Frequency per mile (10%) | Crash Rate (15%) | Buffer Time Index (BTI) (10%) | Event Center buffer mileage (5%) | Weather Sensitive Corridor mileage (10%) | AAADT (20%) | ICE rating (5%) | Composite Rating | Rank |
|--------------------------------------------------|-------------|--------------------------------|------------------------------------|-----------------------------------|------------------|-------------------------------|----------------------------------|------------------------------------------|-------------|-----------------|------------------|------|
| I-235 (jct of IA 28 to jct of US 69)             | 5.7         | 1                              | 10                                 | 4                                 | 1                | 5                             | 1                                | 10                                       | 1           | 5               | 38.5             | 1    |
| I-35/80 (west jct of I-35/80 to US 6)            | 2.1         | 4                              | 1                                  | 3                                 | 3                | 8                             | 7                                | 10                                       | 2           | 4               | 41.5             | 2    |
| I-235 (jct of I-35/80 to jct of IA 28)           | 5.1         | 1                              | 10                                 | 1                                 | 5                | 6                             | 1                                | 10                                       | 3           | 6               | 45.5             | 3    |
| I-80 (Nebraska border to jct of I-29)            | 3.5         | 6                              | 1                                  | 5                                 | 4                | 8                             | 9                                | 10                                       | 5           | 1               | 53.5             | 4    |
| I-29 (South Dakota border to jct of US 20/I-129) | 8.4         | 1                              | 10                                 | 3                                 | 5                | 1                             | 9                                | 10                                       | 9           | 5               | 59               | 5    |
| I-35/I-80 (jct of IA 415 to jct of I-35)         | 2.0         | 8                              | 5                                  | 8                                 | 3                | 8                             | 7                                | 10                                       | 4           | 2               | 60               | 6    |
| I-129 (full route)                               | 0.3         | 1                              | 10                                 | 6                                 | 1                | 4                             | 10                               | 10                                       | 9           | 5               | 61               | 7    |
| I-35/80 (jct of IA 141 to jct of IA 28)          | 3.9         | 7                              | 4                                  | 8                                 | 8                | 9                             | 3                                | 10                                       | 3           | 3               | 63               | 8    |
| I-35 (jct of I-80/I-235 to jct of IA 160)        | 3.1         | 8                              | 4                                  | 7                                 | 7                | 8                             | 5                                | 10                                       | 4           | 4               | 63.5             | 9    |
| I-235 (jct of US 69 to west jct of I-35/80)      | 4.4         | 5                              | 10                                 | 7                                 | 6                | 6                             | 2                                | 10                                       | 5           | 5               | 64               | 10   |
| I-74 (full route)                                | 5.2         | 1                              | 10                                 | 7                                 | 5                | 1                             | 10                               | 10                                       | 8           | 7               | 64.5             | 11   |
| I-35/80 (from jct of IA 28 to IA 415)            | 4.0         | 9                              | 6                                  | 8                                 | 8                | 9                             | 3                                | 10                                       | 2           | 2               | 64.5             | 11   |
| I-35/80 (jct of US 6 to jct of IA 141)           | 2.5         | 10                             | 9                                  | 7                                 | 8                | 8                             | 7                                | 10                                       | 2           | 2               | 68               | 13   |
| I-380 (jct of US 20 to start of US 218)          | 7.3         | 7                              | 2                                  | 9                                 | 7                | 2                             | 10                               | 10                                       | 8           | 8               | 70               | 14   |
| I-35 (jct of IA 5 to jct of I-80/I-235)          | 4.7         | 8                              | 5                                  | 10                                | 6                | 7                             | 3                                | 10                                       | 6           | 6               | 70.5             | 15   |
| I-80 (east jct of I-35/80 to jct of IA 14)       | 28.5        | 10                             | 8                                  | 9                                 | 8                | 8                             | 1                                | 4                                        | 7           | 5               | 72.5             | 16   |
| I-35 (jct of IA 160 to jct of US 30)             | 20.9        | 10                             | 9                                  | 10                                | 6                | 10                            | 1                                | 4                                        | 7           | 5               | 74               | 17   |
| I-29 (jct of I-80 to jct of I-480/US 6)          | 2.9         | 5                              | 10                                 | 10                                | 4                | 5                             | 9                                | 10                                       | 8           | 5               | 74               | 17   |
| I-480 (full route)                               | 0.9         | 10                             | 10                                 | 9                                 | 4                | 4                             | 10                               | 10                                       | 8           | 2               | 75.5             | 19   |
| I-380 (jct of US 30 to jct of IA 100)            | 7.6         | 9                              | 7                                  | 9                                 | 9                | 8                             | 8                                | 10                                       | 5           | 4               | 77               | 20   |

### Interstate Congestion Report

The Iowa DOT Interstate Congestion Report focuses on the major Iowa Interstate corridors including I-29, 35, 74, 80, 235, 280, 380 and 680. The most recent report provides mobility information for the years 2013, 2014, and 2015 and includes several performance metrics:

- Congested Hours
- Congested Hours per Mile
- Speed Performance
- Percent Increase in Typical Travel Time

Table 8 highlights the top 10 congested corridors in 2015. The congestion on I-29 in the Sioux City area was significantly attributed to a large reconstruction project. Figure 11 highlights the comparison on congestion across each corridor. Figure 12 highlights a metro area comparison of congested hours per mile by year.

TABLE 8. INTERSTATE CONGESTION REPORT- 2015 TOP 10 CONGESTED CORRIDORS

| Rank | Route                                            | Location       | Congested Hours |
|------|--------------------------------------------------|----------------|-----------------|
| 1    | Interstate 29 Northbound                         | Sioux City     | 665.0 hours     |
| 2    | Interstate 29 Southbound                         | Sioux City     | 631.2 hours     |
| 3    | Interstate 29 Southbound                         | Sioux City     | 274.1 hours     |
| 4    | Interstate 235 Eastbound                         | Des Moines     | 233.0 hours     |
| 5    | Interstate 235 Westbound                         | Des Moines     | 225.0 hours     |
| 6    | Interstate 380 Southbound                        | Waterloo       | 169.4 hours     |
| 7    | Interstate 380 Northbound                        | Waterloo       | 154.0 hours     |
| 8    | Interstate 29 Northbound/Interstate 80 Westbound | Council Bluffs | 96.0 hours      |
| 9    | Interstate 35 Southbound/Interstate 80 Westbound | Des Moines     | 91.0 hours      |
| 10   | Interstate 80 Eastbound                          | Quad Cities    | 89.0 hours      |

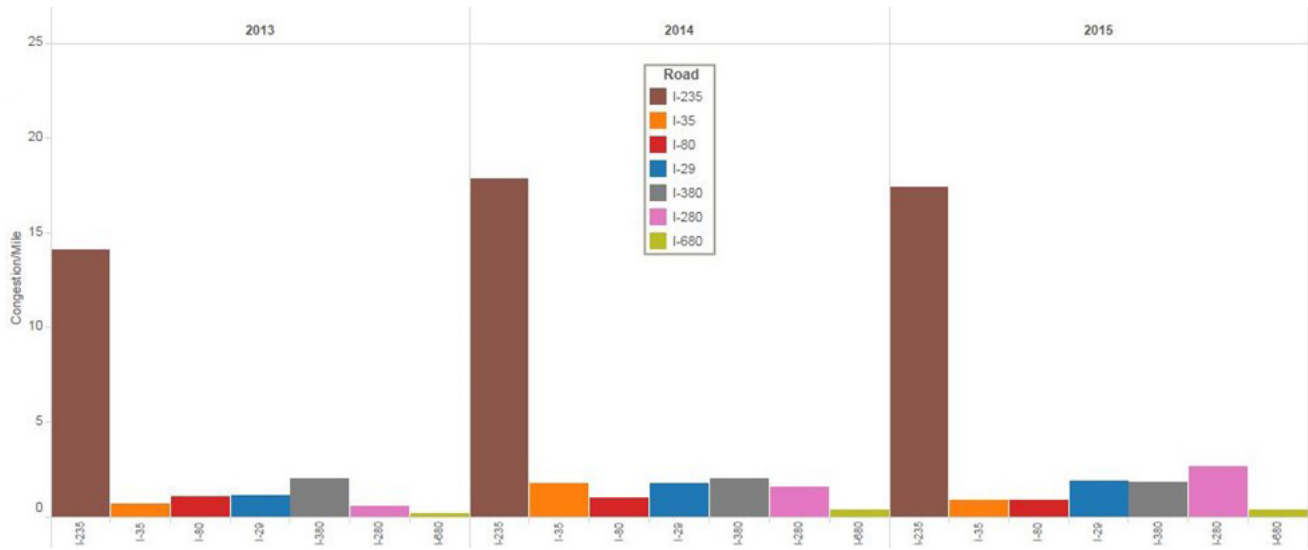


FIGURE 11. CONGESTED HOURS PER MILE INTERSTATE COMPARISON BY YEAR.

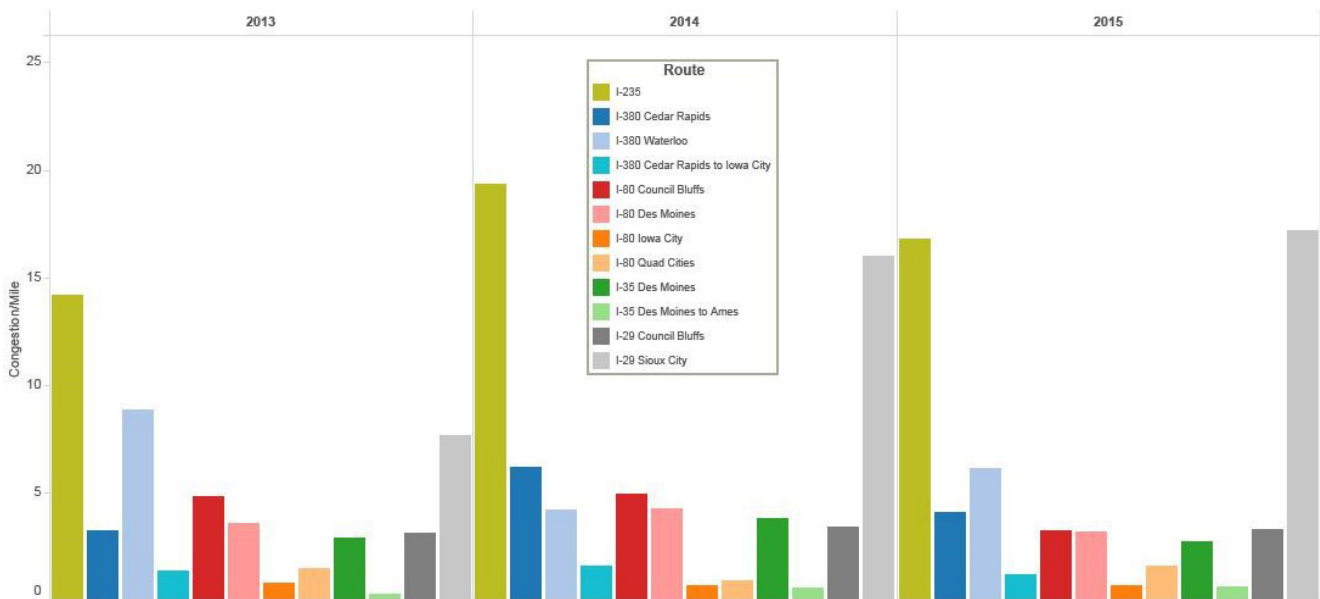


FIGURE 12. CONGESTED HOURS PER MILE METRO AREA COMPARISON BY YEAR

## TMC Monthly and Annual Report

The TMC publishes a monthly and annual report containing a significant amount of information, as summarized in Table 9.

TABLE 9. SUMMARY OF 2016 TMC PERFORMANCE

| Category                         | Measures                                       | 2016 Data                     |            |           |                          |           |          |            |
|----------------------------------|------------------------------------------------|-------------------------------|------------|-----------|--------------------------|-----------|----------|------------|
| Incident Summary                 | Total Incidents Managed by the TMC             | <i>Total</i>                  |            |           | <i>Average Per Month</i> |           |          |            |
|                                  |                                                | 24,931                        |            |           | 2077                     |           |          |            |
|                                  | Secondary Incidents (observed by TMC)          | 177 Total                     |            |           |                          |           |          |            |
|                                  | Incidents by Day of the Week                   | <i>Sun</i>                    | <i>M</i>   | <i>T</i>  | <i>W</i>                 | <i>Th</i> | <i>F</i> | <i>Sat</i> |
|                                  |                                                | 1231                          | 4305       | 4808      | 4239                     | 4308      | 4780     | 1260       |
|                                  | Incidents Managed During Peak Hours            | <i>PM Peak</i>                |            |           | <i>AM Peak</i>           |           |          |            |
|                                  |                                                | 5722                          |            |           | 5714                     |           |          |            |
|                                  | Lane Blocking Incidents                        | 2597 Total                    |            |           |                          |           |          |            |
|                                  | Average Time to Clear a Lane-Blocking Incident | 52.6 Minutes                  |            |           |                          |           |          |            |
|                                  | Incident Types                                 | <i>Stalled Vehicle</i>        |            |           | 12,872                   |           |          |            |
|                                  |                                                | <i>2 Vehicle Collision</i>    |            |           | 1587                     |           |          |            |
|                                  |                                                | <i>Winter Closure</i>         |            |           | 6                        |           |          |            |
|                                  |                                                | <i>Flooding</i>               |            |           | 106                      |           |          |            |
|                                  |                                                | <i>3+ Vehicle Collision</i>   |            |           | 480                      |           |          |            |
|                                  |                                                | <i>1 Vehicle Collision</i>    |            |           | 1745                     |           |          |            |
|                                  |                                                | <i>Debris on Roadway</i>      |            |           | 7299                     |           |          |            |
|                                  |                                                | <i>Slow Traffic</i>           |            |           | 474                      |           |          |            |
| Freight Incidents                | <i>Stalls</i>                                  |                               |            | 1846      |                          |           |          |            |
|                                  | <i>1 Vehicle Crash</i>                         |                               |            | 326       |                          |           |          |            |
|                                  | <i>2 Vehicle Crash</i>                         |                               |            | 258       |                          |           |          |            |
|                                  | <i>3+ Vehicle Crash</i>                        |                               |            | 52        |                          |           |          |            |
|                                  | <i>Freight Incident Clearance Time</i>         |                               |            | > 2 hours |                          |           |          |            |
| Miscellaneous Freight Statistics | <i>Tractor Trailer Roll Overs</i>              |                               |            | 61        |                          |           |          |            |
|                                  | <i>Vehicle HazMat Spills</i>                   |                               |            | 12        |                          |           |          |            |
|                                  | <i>Rail Incidents</i>                          |                               |            | 163       |                          |           |          |            |
| Highway Helper                   | Total Incidents Responded to by Area           | <i>Des Moines</i>             |            |           | 6730                     |           |          |            |
|                                  |                                                | <i>Council Bluffs</i>         |            |           | 6965                     |           |          |            |
|                                  |                                                | <i>Iowa City/Cedar Rapids</i> |            |           | 3758                     |           |          |            |
|                                  | Total Incidents Responded to by Highway Helper | <i>Total</i>                  |            |           | <i>Ave. Per Month</i>    |           |          |            |
|                                  |                                                | 17,453                        |            |           | 1454                     |           |          |            |
|                                  | Incident Response by Time of Day               | <i>AM Commute</i>             |            |           | 4397                     |           |          |            |
|                                  |                                                | <i>PM Commute</i>             |            |           | 3943                     |           |          |            |
|                                  |                                                | <i>Off Peak Hours</i>         |            |           | 9113                     |           |          |            |
|                                  | Highway Helper Incident Response Type          | <i>Removed Debris</i>         |            |           | 6931 - 43%               |           |          |            |
|                                  |                                                | <i>Flat Tire</i>              |            |           | 12 - 0%                  |           |          |            |
| <i>Provide Traffic Control</i>   |                                                |                               | 2241 - 14% |           |                          |           |          |            |

| Category                                     | Measures                                            | 2016 Data                  |                      |            |                |               |                        |
|----------------------------------------------|-----------------------------------------------------|----------------------------|----------------------|------------|----------------|---------------|------------------------|
| Highway Helper Incident Response Type-cont'd | <i>Provide Fuel</i>                                 | 755 – 5%                   |                      |            |                |               |                        |
|                                              | <i>Jump Start</i>                                   | 156 – 1%                   |                      |            |                |               |                        |
|                                              | <i>Abandoned/Tagged</i>                             | 1029 – 6%                  |                      |            |                |               |                        |
|                                              | <i>Push/Pull</i>                                    | 82 – 1%                    |                      |            |                |               |                        |
|                                              | <i>Disregarded</i>                                  | 467 – 3%                   |                      |            |                |               |                        |
|                                              | <i>Mechanical Repair</i>                            | 444 – 3%                   |                      |            |                |               |                        |
|                                              | <i>Motorist Transport</i>                           | 199 – 1%                   |                      |            |                |               |                        |
|                                              | <i>Checked Welfare</i>                              | 3604 – 22%                 |                      |            |                |               |                        |
|                                              | <i>Gave Directions</i>                              | 118 – 1%                   |                      |            |                |               |                        |
| District Summaries                           | <i>District</i>                                     | 1                          | 2                    | 3          | 4              | 5             | 6                      |
|                                              | Slow Traffic Events by District                     | 296                        | 4                    | 29         | 29             | 7             | 107                    |
|                                              | Incidents                                           | 9969                       | 398                  | 567        | 6619           | 391           | 5676                   |
|                                              | Roadwork                                            | 6195                       | 2670                 | 2931       | 3167           | 3465          | 5145                   |
|                                              | Lane Blocking Incidents:<br>Lane Blocking Incidents | 1031                       | 141                  | 234        | 401            | 123           | 665                    |
|                                              | Average Time to Clear Lanes                         | 37.4                       | 89.6                 | 70.4       | 56.9           | 87.8          | 52.3                   |
|                                              | Workzone Crashes<br>Secondary Crashes               | 80                         | 3                    | 4          | 46             | 2             | 42                     |
|                                              | Work Zone Crashes                                   | 25                         | 3                    | 12         | 14             | 16            | 40                     |
|                                              | Heat Map – Critical City/County                     | Des Moines                 | Cedar Falls/Waterloo | Sioux City | Council Bluffs | Warren County | Cedar Rapids/Iowa City |
| Highest Congestion District                  | 62% of the slow traffic events were in District 1   |                            |                      |            |                |               |                        |
| Traveler Information                         | 511 Traveler Information Performance                | <i>Total Visits to 511</i> |                      |            |                | 3,395,928     |                        |
|                                              |                                                     | <i>Total App Downloads</i> |                      |            |                | 71,582        |                        |
|                                              |                                                     | <i>Total 511 Calls</i>     |                      |            |                | 129,827       |                        |

Red = Highest      Green = Lowest

## Traffic Critical Projects Annual Report

The TCP program identifies key construction projects across the state that may cause significant safety or mobility issues to the traveling public. Using various mitigation methods, the TCP program works to reduce or eliminate any potential safety or mobility concerns. On an annual basis, CTRE collects data and analyzes how each IWZ equipped site performs. Figure 13 includes an example summary of a TCP evaluation for one location equipped with IWZ monitoring equipment.

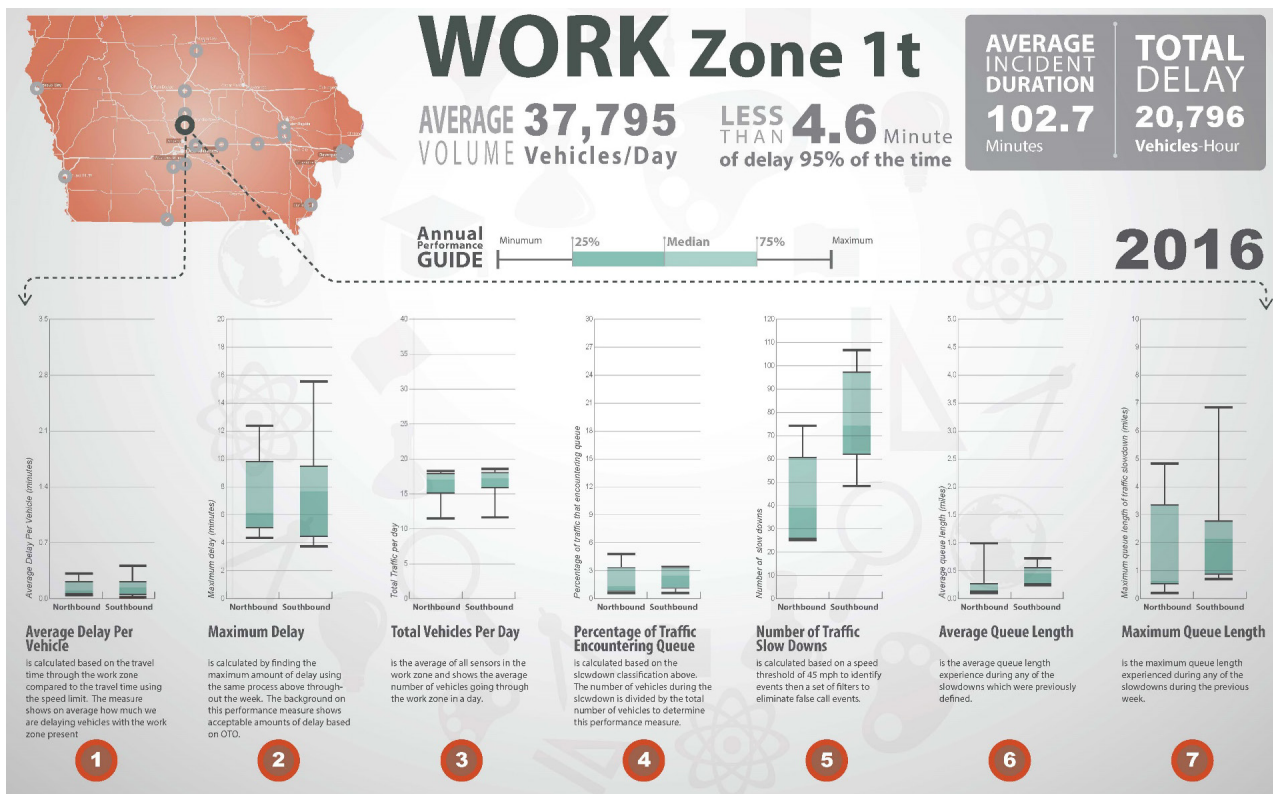


FIGURE 13. TRAFFIC CRITICAL PROJECT EVALUATION EXAMPLE

## TIM-Related Legislation

From a policy perspective, most states measure how well they are positioned to deliver TIM services based on three fundamental pieces of enabling legislation:

1. **Move Over Legislation** – requires motorists to change lanes or slowdown in vicinity of a police, fire, EMS, maintenance and/or towing vehicle with their lights on. Iowa passed move over legislation in 2002. Iowa State law requires drivers approaching a stationary emergency vehicle displaying flashing lights, including towing and recovery vehicles, traveling in the same direction, to vacate the lane closest if safe and possible to do so, or slow to a reasonable speed for road and traffic conditions (Iowa Code Section 321.323A).
2. **Driver Removal Legislation** - aims to expedite removal of damaged or disabled vehicles from the travel lanes to enhance the overall level of safety on the roadway and reduce associated congestion and delay. Iowa recently passed driver removal legislation. The Quick Clearance, Steer It, Clear It Bill was recently signed by the governor in May 2017 (House File 313). Iowa DOT and others are working on a variety of awareness activities.
3. **Authority Removal Legislation** - provide authorization to a pre-designated set of public agencies - generally including state, county, and local law enforcement or state departments of transportation (DOTs) - to remove damaged or disabled vehicles and/or spilled cargo from the roadway that is determined to be a hazard. Iowa's authority removal laws are located in Iowa Code 321.89.

## Communications Interoperability

The general goal of interoperability is to establish standards-based, open communications between response agencies and other support elements during times of need, such as major incidents and any natural or man-made emergency or disaster event where inter-agency coordination is critical to the effectiveness of the response. Ideally, interoperability includes voice, data and video. Interoperability may be needed at all levels, center-to-center, center-to-field and field-to-field depending on the magnitude and nature of the event.

Interoperability is a critical element of TIM. The day-to-day responses are the most frequent use of inter-discipline communications, this is the place where interoperability will make incremental improvements and gain buy-in at the field level. If we can become efficient at interoperability on the scenes of day-to-day traffic crashes, then interoperability will be the norm during the larger scale events; responders and agencies will be able to communicate across agency boundaries without pulling out guide books and interoperability will become automatic. The Iowa Highway Helper and other key Iowa DOT field units currently have a level of interoperability with state and local agencies.

Iowa has a number of building blocks in place for interoperability such as memorandums of understanding (MOUs), plans and procedures. Generally these documents enable institutional communications and identify the players and some of the details.

- *Iowa DOT TSMO Strategic Plan* - Establishes Strategic Objective 5. Coordination, “Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system.”
- MOU between the ISP and the Iowa DOT TMC (formerly called Operations Support Center) - Dating back to 2010, established an agreement on what type of incidents and events require two-way communications.
- Iowa DOT Winter Weather Preparedness and Communications Plan - Identifies coordination and communications procedures.
- Iowa DOT Radio Instruction, Zones and Frequencies - Guides radio users on setting their radios to the interoperability channels. These interoperable capable radios are installed in key mobile units across the state.
- State of Iowa Emergency Response Plan/Communication (ESF-2) - Establishes a framework and responsibilities for communications during emergency events.

The State of Iowa established the Iowa Statewide Interoperable Communications System Board (ISICSB) in 2007. The mission of ISICSB is to:

*“Develop, implement, and oversee policy, operations, and fiscal components of communications interoperability efforts at the state and local level, and coordinate with similar efforts at the federal level, with the ultimate objective of developing and overseeing the operation of a statewide integrated public safety communications interoperability system.”*

The ISICSB has started the construction of a statewide interoperable radio system.

Iowa also established a FirstNet Broadband Subcommittee and Iowa DOT is represented on the committee. FirstNet is a national effort to develop a high speed, broadband wireless network for public safety. FirstNet offers a platform for improved inter-agency communications at all levels.

Iowa DOT shares traffic video including camera control with a large number of partners, including law enforcement and dispatch centers, and will allow this access to any public safety agency that requests it.



## **PART 4. TIM PROGRAM ASSESSMENT**

The TIM Program Assessment is comprised of two major activities:

- Gap Analysis – using the recently developed FHWA TIM Gap Analysis Primer
- Self-Assessment – using the recently updated FHWA 2016 TIM Program Self-Assessment

There is overlap in the two activities, but the team decided to complete both exercises to ensure opportunities for improvement were not lost.

### **TIM Gap Analysis**

As part of the gap analysis for the TIM Service Layer development, the FHWA *Traffic Incident Management Gap Analysis Primer* was adopted as a framework to help identify areas of opportunity. Gap analysis is defined as “a technique that businesses use to determine what steps need to be taken in order to achieve a future state.” Gap analysis also helps programs reflect on who they are and ask who they want to be in the future. The TIM Gap Analysis identifies the activities or components of successful TIM programs including degree of implementation. Tables 11-13 list the model activities, degree of implementation and a current Iowa status. Results of the gap analysis helped to shape the proposed TIM activities over the next 5 years.

TABLE 10. IOWA TIM GAP ANALYSIS – INSTITUTIONAL ASSESSMENT

| Activity                                                                                                                        | Implementation Degree |   |   | Status in Iowa                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|---|---|----------------------------------------------------------------------------------------------------|
|                                                                                                                                 | L                     | M | H |                                                                                                    |
| 1. TIM multiagency team or task force                                                                                           |                       | ✓ |   | Statewide TIM Committee formed in 2016                                                             |
| 2. Multiagency training                                                                                                         |                       | ✓ |   | Emergency Responder Training and about half a dozen tabletop exercises each year                   |
| 3. Multiagency post-incident debriefings                                                                                        |                       |   | ✓ | Over a dozen completed in 2016                                                                     |
| 4. Plans for special events                                                                                                     |                       |   | ✓ | Support events such as Football Saturday, NCAA Tournament, and State Fair                          |
| 5. Multiagency agreements/memoranda on incident scene roles and responsibilities; planning for and funding for the TIM program. | ✓                     |   |   | One executed for Council Bluffs/Omaha area                                                         |
| 6. Planning to support the TIM activities                                                                                       |                       |   | ✓ | DOT invests heavily in TIM plans (i.e., alternate route plans)                                     |
| 7. Designated point person for TIM – primary activity                                                                           |                       |   | ✓ | DOT has several staff. Limited at other agencies                                                   |
| 8. Multiagency agreement on incident performance measures                                                                       | ✓                     |   |   | None                                                                                               |
| 9. Collect and analyze data related to roadway response and clearance times                                                     |                       |   | ✓ | Collected via TMC                                                                                  |
| 10. Have targets (i.e., time goals) for roadway response and clearance times                                                    | ✓                     |   |   | Targets are recommended in this report                                                             |
| 11. Routinely review whether progress is made in achieving the targets                                                          | ✓                     |   |   | Anticipated after targets are adopted                                                              |
| 12. Track performance in reducing secondary incidents                                                                           |                       | ✓ |   | Collecting information at TMC. Crash report in process of being modified.                          |
| 13. Deploy effective and affordable TIM technology                                                                              |                       |   | ✓ | Increasing TMC coverage                                                                            |
| 14. Have 24/7 availability of key responders and equipment                                                                      |                       |   | ✓ | Coordinated via TMC                                                                                |
| 15. Develop and perform multiagency resource management                                                                         | ✓                     |   |   | Done at the county level and at Iowa Homeland Security and Emergency Management Department (HSEMD) |
| 16. Perform effective TIM budgeting                                                                                             |                       |   | ✓ | DOT has established 5-year TSMO budget, including TIM                                              |
| 17. Education and awareness partnerships                                                                                        | ✓                     |   |   | Limited. Planning for TIM Training facility near Newton.                                           |

TABLE 11. IOWA TIM GAP ANALYSIS – OPERATIONS ASSESSMENT

| Activity                                                                                                                                                  | Implementation Degree |   |   | Status in Iowa                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---|---|----------------------------------------------------------------------------|
|                                                                                                                                                           | L                     | M | H |                                                                            |
| 1. Have “authority removal” laws in place and understood                                                                                                  |                       |   | ✓ | Existing Iowa Code 321.89                                                  |
| 2. Have “driver removal” laws in place and understood                                                                                                     |                       |   | ✓ | Recently passed in 2017 legislative session. Awareness activities required |
| 3. Safety service patrol for incident response                                                                                                            |                       |   | ✓ | Demand for Highway Helper resources continues to grow                      |
| 4. Utilize the Incident Command System (ICS)                                                                                                              |                       |   | ✓ | All DOT field staff trained in ICS                                         |
| 5. Have response equipment pre-staged                                                                                                                     | ✓                     |   |   | None                                                                       |
| 6. Identify and document resources so that a list of towing and recovery operators is available for incident response and clearance.                      |                       |   | ✓ | At ISP Communications Centers                                              |
| 7. Identify and document resources so that a list of HazMat contractors is available for incident response and clearance.                                 |                       |   | ✓ | At ISP Communications Centers                                              |
| 8. At least one responding agency has authority to override the decision to utilize the responsible party’s HazMat contractor and call in other resources |                       |   | ✓ | Yes                                                                        |
| 9. Medical examiner response is clearly defined and understood for incidents involving fatalities                                                         | ✓                     |   |   | Need consistency across the state                                          |
| 10. Have the electric utility companies’ role clearly defined for incidents involving downed electrical wires                                             |                       |   | ✓ | Electric utility companies routinely invited to tabletop exercises         |
| 11. Procedures in place for expedited accident reconstruction/ investigation                                                                              | ✓                     |   |   | Scene usually set in place until investigator gets to site                 |
| 12. Policy in place for removal of abandoned vehicles                                                                                                     |                       |   | ✓ | Iowa codes dictate                                                         |
| 13. “Move Over” laws in place and understood                                                                                                              |                       |   | ✓ | Effective 2002. Law well understood. Iowa Law 321.323A                     |
| 14. All responders trained in MUTCD traffic control guidelines                                                                                            | ✓                     |   |   | No                                                                         |
| 15. Utilize transportation resources to conduct MUTCD compliant traffic control for various levels of incidents                                           |                       |   | ✓ | Long-term incidents                                                        |
| 16. Routinely utilize traffic control procedures                                                                                                          |                       |   | ✓ | For longer term incidents                                                  |
| 17. Have mutually understood equipment staging and emergency lighting procedures                                                                          | ✓                     |   |   | No                                                                         |
| 18. Have procedures in place for prompt responder notification                                                                                            |                       |   | ✓ | Strong communication between TMC and County Comm Centers                   |

TABLE 12. IOWA TIM GAP ANALYSIS – TECHNOLOGY ASSESSMENT

| Activity                                                                                    | Implementation Degree |   |   | Status in Iowa                                        |
|---------------------------------------------------------------------------------------------|-----------------------|---|---|-------------------------------------------------------|
|                                                                                             | L                     | M | H |                                                       |
| 1. TMC coordinates incident detection, notification and response                            |                       |   | ✓ | Role and coverage continues to expand                 |
| 2. Share data/video between agencies                                                        |                       |   | ✓ | Video shared by TMC with many agencies                |
| 3. Have specific policies and procedures for traffic management during incident response    |                       |   | ✓ | Statewide TIM Plans provide information               |
| 4. Provide for interoperable, interagency communications onsite between incident responders | ✓                     |   |   | Work in progress                                      |
| 5. Have a real-time motorist information system providing incident-specific information     |                       |   | ✓ | DMS, 511, social media, etc.                          |
| 6. Provide motorists with travel time estimates for route segments                          |                       | ✓ |   | Limited travel times provided in Des Moines area only |
| 7. Develop and implement cost recovery and management systems                               |                       |   | ✓ | Long standing tort claims processes                   |

### 2016 TIM Self-Assessment Results

For the past three years, Iowa DOT has completed an FHWA TIM Self-Assessment. In 2016, nine different workshops were held around the state to gather regional information. The TIM-Self-Assessment was recently modified to incorporate a Capability Maturity Model (CMM) framework. The CMM framework offers a systematic way of scoring how well an organization addresses a variety of strategic, tactical, and support activities. Table 13 summarizes the overall scores for each multi-disciplinary workshop location and averages them all. Overall, the state is at a score of 2.35, on a scale of 4, which means Iowa is currently managed and on its way to being integrated, as illustrated in Figure 14. The overall TSMO Program was recently assessed at a 2.2, which demonstrates the current TIM Program is ahead of other TSMO areas and continues to be on a good trajectory to meet the goal of a 3.0 in four years.

TABLE 13. 2016 TIM SELF-ASSESSMENT RESULTS

| LOCATION                         | DIMENSION                   |                            |                          | Overall<br>(All 51 Questions) |
|----------------------------------|-----------------------------|----------------------------|--------------------------|-------------------------------|
|                                  | Strategic<br>(24 Questions) | Tactical<br>(22 Questions) | Support<br>(5 Questions) |                               |
| Des Moines                       | 2.25                        | 2.36                       | 2.80                     | 2.35                          |
| Cedar Rapids                     | 2.04                        | 2.32                       | 2.80                     | 2.24                          |
| Council Bluffs                   | 2.54                        | 2.64                       | 2.80                     | 2.61                          |
| Cedar Falls                      | 1.88                        | 2.18                       | 2.60                     | 2.08                          |
| Sioux City                       | 2.50                        | 2.45                       | 2.80                     | 2.51                          |
| Davenport                        | 2.29                        | 2.32                       | 2.80                     | 2.35                          |
| Dubuque                          | 2.25                        | 2.27                       | 2.80                     | 2.31                          |
| Mason City                       | 2.25                        | 2.32                       | 2.80                     | 2.33                          |
| Ames                             | 2.29                        | 2.32                       | 2.80                     | 2.35                          |
| <b>Average - All 9 locations</b> |                             |                            |                          | <b>2.35</b>                   |

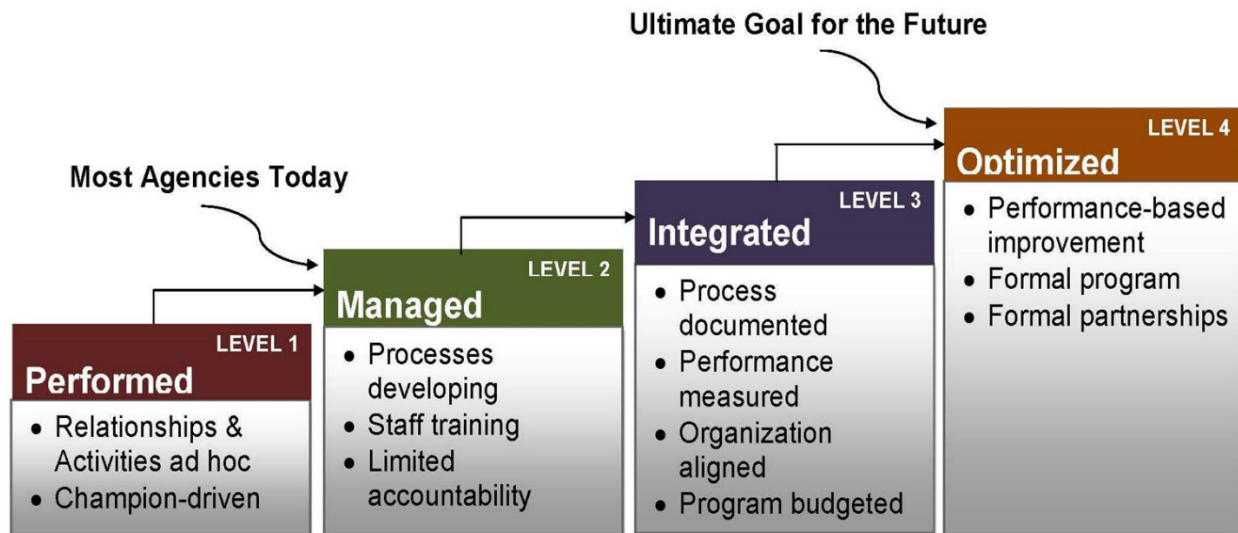


FIGURE 14. CAPABILITY MATURITY MODEL LEVELS

## PART 5. PERFORMANCE MANAGEMENT

The purpose of performance management is to evaluate the effectiveness of the TIM program and support programmatic decisions related to resource allocation, technology deployment, planning and action to effectively deliver the program objectives. Performance management provides the foundation for outcome-based program management, measuring how well the program is performing and adapting to improve the outcome of resource prioritization and investment. For each of the TIM Service Layer objectives, proposed measures have been developed to support outcome-based program management. Several measures go beyond current measures and require additional data collection and evaluation to support robust performance management. Table 14 shows the TIM Service Area objectives, associated performance measure, the intent of each measure and the source of data for the measure.

TABLE 14. TIM PERFORMANCE MEASURES AND DATA SOURCES

| TIM Service Area Objective                       | Performance Measure                                          | Intent of Measures                                                                                                                                                                      | Data Source                                                                                                                                                                                                  |
|--------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Objective 1:<br/>Reduce secondary crashes</b> | 1.1 Number of secondary incidents                            | Tracking the number of secondary incidents will allow Iowa DOT to monitor trends in secondary crashes.                                                                                  | The Iowa DOT TMC Performance Report tracks secondary incidents for incidents managed by the TMC each month.                                                                                                  |
|                                                  | 1.2 Number of incidents involving on-scene responders struck | Secondary crashes that involve on-scene responders indicate the need for improvements to scene management and traffic control. This measure can identify areas to improve scene safety. | Current data do not include a designation for responders hit during response. It is recommended that this be included on crash reports and analyzed statewide                                                |
|                                                  | 1.3 Average incident response time                           | Quick response can reduce the potential for secondary crashes by providing traffic control and scene management to protect the scene and back of queue.                                 | Response times are not currently available statewide.                                                                                                                                                        |
|                                                  | 1.4 Average incident clearance time                          | The potential for secondary crashes increases with the duration of an incident. Average incident clearance time is an indicator of the exposure to secondary crashes.                   | The TMC reports on the average time to clear a lane-blocking incident for incidents managed by the TMC. These are reported for all routes, Interstate routes in urban areas and rural non-Interstate routes. |
| <b>Objective 2:<br/>Improve patient outcomes</b> | 2.1 Average incident response time                           | Quick response to an incident supports improved patient outcomes by securing the                                                                                                        | Response times are not currently available statewide.                                                                                                                                                        |

| TIM Service Area Objective                                                                   | Performance Measure                                   | Intent of Measures                                                                                                                                                                               | Data Source                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                              |                                                       | scene and providing prompt patient care.                                                                                                                                                         |                                                                                                                                                                                                              |
|                                                                                              | 2.2 Average incident clearance time                   | Incident clearance times are an indication of effective scene management and timely transport of patients.                                                                                       | The TMC reports on the average time to clear a lane-blocking incident for incidents managed by the TMC. These are reported for all routes, Interstate routes in urban areas and rural non-Interstate routes. |
| <b>Objective 3: Respond quickly to incidents</b>                                             | 3.1 Average incident response time                    | Average incident response time is a measure of how quickly incidents are responded to.                                                                                                           | Response times are not currently available statewide.                                                                                                                                                        |
| <b>Objective 4: Clear incidents quickly</b>                                                  | 4.1 Average incident clearance time                   | Average incident clearance time can be used to track how quickly incidents are cleared.                                                                                                          | The TMC reports on the average time to clear a lane-blocking incident for incidents managed by the TMC. These are reported for all routes, Interstate routes in urban areas and rural non-Interstate routes. |
| <b>Objective 5: Provide real-time traveler information on incidents and alternate routes</b> | 5.1 Total number of calls to 511                      | The number of calls to 511 indicates the extent of traveler use of the 511 call system.                                                                                                          | The TMC reports the total number of phone calls, not specific to incidents.                                                                                                                                  |
|                                                                                              | 5.2 Total visits for 511 website                      | The number of visits to 511 website indicates the extent of traveler use of the 511 website.                                                                                                     | The TMC tracks the total number of visits to the website, not specific to incidents.                                                                                                                         |
|                                                                                              | 5.3 Percent of incidents posted to 511                | For incident traveler information to be easily accessible, incidents should be posted to the 511 system and include information on any incident that impacts the flow of traffic.                | Not currently tracked but data is available.                                                                                                                                                                 |
|                                                                                              | 5.4 Percent of incident-related posts on social media | For incident traveler information to be easily accessible, incidents should be posted on Iowa DOT's social media sites and include information on any incident that impacts the flow of traffic. | Not currently tracked but data is available.                                                                                                                                                                 |
|                                                                                              | 5.5 Percent of incidents posted to message boards     | For incident traveler information to be easily accessible, incidents should be posted to                                                                                                         | The TMC reports the total number of activations of message boards, not specific to incidents.                                                                                                                |

| TIM Service Area Objective                               | Performance Measure                                                                                   | Intent of Measures                                                                                                                                | Data Source                                                                                                                                                                                                  |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                          |                                                                                                       | message boards if the incident impacts the flow of traffic.                                                                                       |                                                                                                                                                                                                              |
|                                                          | 5.6 Average time to update information on 511                                                         | Incident information should be provided in a timely manner. This measure looks at trends in timeliness of information provided through 511.       | Not currently available.                                                                                                                                                                                     |
|                                                          | 5.7 Average time to update information on message boards                                              | Incident information should be provided in a timely manner. This measure looks at trends in timeliness of information provided on message boards. | Not currently available.                                                                                                                                                                                     |
|                                                          | 5.8 Percent of messages that included alternate or diversion route information                        | Incident information should include alternate route information to help move traffic from the impacted facility to its destination.               | Not currently available.                                                                                                                                                                                     |
| <b>Objective 6: Enhance TIM multiagency coordination</b> | 6.1 Average incident clearance time                                                                   | Enhanced multiagency coordination should allow for a decrease in incident clearance times. This measure is seen as an indicator of coordination.  | The TMC reports on the average time to clear a lane-blocking incident for incidents managed by the TMC. These are reported for all routes, Interstate routes in urban areas and rural non-Interstate routes. |
| <b>Objective 7: Support TIM through interoperability</b> | 7.1 Percent of response agencies statewide with interoperable communications between dispatch centers | This is a measure of the interoperability between agency communications centers.                                                                  | Not currently available.                                                                                                                                                                                     |
|                                                          | 7.2 Percent of response agencies statewide with interoperable on-scene communications capability      | This is a measure of radio interoperability between agencies responding to an incident.                                                           | Not currently available.                                                                                                                                                                                     |
|                                                          | 7.3 Percent of response agencies statewide with data sharing capability                               | This is a measure of data interoperability between agencies.                                                                                      | Not currently available.                                                                                                                                                                                     |



| TIM Service Area Objective                                                            | Performance Measure                                                      | Intent of Measures                                                                                                             | Data Source                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | 7.4 Percent of response agencies statewide with video sharing capability | This is a measure of the video sharing interoperability.                                                                       | Not currently available.                                                                                                                                                                                     |
| <b>Objective 8: Coordinate response to large scale incidents with adjacent states</b> | 8.1 Average incident response time                                       | This measures the response time to large scale, multi-agency incidents that require response from agencies in adjacent states. | Response times are not currently available statewide.                                                                                                                                                        |
|                                                                                       | 8.2 Average incident clearance time                                      | This measures the time required to clear a multi-agency incident that includes response from agencies in adjacent states.      | The TMC reports on the average time to clear a lane-blocking incident for incidents managed by the TMC. These are reported for all routes, Interstate routes in urban areas and rural non-Interstate routes. |

While there are a number of measures recommended in Table 14, there are a few that have been further defined and preliminary targets recommended. Collecting incident response time will require better information sharing with ISP and other emergency responders. Furthermore, due to the proximity of emergency response facilities, urban and rural targets for response are recommended. The TMC does a good job of collecting roadway and incident clearance times. One of the issues recently uncovered was related to the relatively high incident clearance time associated with freight vehicles. One recommendation further described in Part 6 of the report includes piloting a towing incentive program. The program essentially would allow the TMC to designate specific incidents with freight to be eligible for an extra financial incentive if the incident is cleared under the established target. Other states have had success in driving down the time to clear complicated, major incidents.

TABLE 15. PROPOSED HIGH PRIORITY TIM PERFORMANCE MEASURE TARGETS

| High Priority Performance Measure                               | Urban    | Rural    |
|-----------------------------------------------------------------|----------|----------|
| <b>Average of all Traffic Incidents</b>                         |          |          |
| Average roadway clearance time                                  | 30 min.  | 45 min.  |
| Average incident clearance time                                 | 45 min.  | 60 min.  |
| <b>Average for Freight Traffic Incidents</b>                    |          |          |
| Average roadway clearance time                                  | 90 min.  | 105 min. |
| Average incident clearance time                                 | 105 min. | 200 min. |
| <b>Freight Incidents w/ Towing Incentive activated (Future)</b> |          |          |
| Average roadway clearance time                                  | 45 min.  | 60 min.  |
| Average incident clearance time                                 | 60 min.  | 75 min.  |






## PART 6. 5-YEAR ACTION RECOMMENDATIONS

In order to achieve the TIM Service Layer objectives outlined earlier in the report, Iowa DOT has developed 5-Year Action Recommendations based on current conditions, gap analysis, self-assessment, and TIM Blueprint recommendations that have not moved forward.

### Connecting Goals and Objectives to Services and Activities

Table 16 tracks TSMO Goals and strategic objectives, identifying specific service and activities to support objectives at all three levels of planning: strategic, programmatic and service layers. It includes statewide recommendations carried forward from the TIM Blueprint as well as activities defined through the TIM Service Layer planning process.

TABLE 16. RECOMMENDED TIM SERVICE LAYER PLAN SERVICES AND ACTIVITIES

| Goal                                                                                                | Strategic Objective                                                                                                             | Services and Activities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Safety         | Reduce crash frequency and severity                                                                                             | S1. Provide Move Over law education<br>S2. Develop towing and recovery personnel qualifications<br>S3. Provide strategic expansion of Highway Helper Program<br>S4. Track Emergency Response and Highway Worker Struck-by and Near-Miss Incidents<br>S5. Integrate TIM principles into Driver Education Curriculum<br>S6. Develop multi-agency TIM Scene Guidelines                                                                                                                                                                                                                                                                                      |
| <br>Reliability  | Improve transportation reliability, increase system resiliency, and capacity in critical corridors                              | R1. Develop statewide response and clearance targets<br>R2. Standardize crash scene investigation in partnership with Iowa Association of County Medical Examiners<br>R3. Address TIM in TCP development processes<br>R4. Pilot Heavy Tow and Recovery Incentive Program                                                                                                                                                                                                                                                                                                                                                                                 |
| <br>Efficiency   | Minimize traffic delay and maximize system efficiency to keep traffic moving                                                    | E1. Implement statewide diversion routes<br>E2. Create TMC concept of operations and inter-governmental agreements to integrate traffic signal control during events<br>E3. Promote Quick clearance laws<br>E4. Pre-stage response equipment                                                                                                                                                                                                                                                                                                                                                                                                             |
| <br>Convenience  | Provide ease of access and mobility choices to customers                                                                        | CON1. Provide motorists with travel time estimates during incidents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <br>Coordination | Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system | CDN1. Develop a statewide Joint Operations Policy for TIM<br>CDN2. Develop a comprehensive Iowa DOT TIM Program SOP<br>CDN3. Formalize multiagency TIM teams in each District<br>CDN4. Create online TIM credential-controlled and uncontrolled information to program members<br>CDN5. Expand multiagency resource management<br>CDN6. Expand and enhance TIM training<br>CDN7. Develop on-scene interoperable communications<br>CDN8. Share data/video between agencies<br>CDN9. Develop framework to gather, analyze and share TIM data amongst emergency response partners<br>CDN10. Convert Statewide TIM Committee to be a Non-Profit Organization |

## Services and Activities Description

For each recommendation identified in Table 16. Recommended TIM Service Layer Plan Services and Activities, the following provides a brief description and a list of recommended services and activities to accomplish the tactic as well as a list of measures intended to track and evaluate how well the activities are supporting the desired outcomes. The services and activities range from construction projects to technology deployment to public education campaigns depending on the recommendation and the most effective approach for meeting the objective. In addition, other TIM programs around the country can offer best practices. National peer review sessions, conferences and other venues are also valuable tools to capture noteworthy practices.

### **S1. PROVIDE MOVE OVER LAW EDUCATION**

The Move Over law requires drivers to move over or slow down when passing an emergency vehicle with flashing lights. This law is designed to improve scene safety, the safety of responders and the safety of the traveling public. Public education about the law, its importance and the associated fines supports incident safety.

Recommended Services and Activities:

- Develop public information campaign to educate the public about the Move Over law
- Install regulatory signs at key locations on Interstates to support compliance
- Work with DMV to incorporate Move Over law in driver training curriculum

### **S2. DEVELOP TOWING AND RECOVERY PERSONNEL QUALIFICATIONS**

Towing and recovery services that respond to traffic incidents on Interstates should be trained and maintain qualifications for work in high-speed traffic environments for the safety of the towing and recovery personnel and the traveling public.

Recommended Services and Activities:

- Work with ISP and Towing & Recovery Professionals of Iowa to develop statewide qualifications for towing and recovery personnel responding to incidents on the Interstate system
- Develop resource materials to support training towing and recovery personnel to meet the minimum qualifications

### **S3. PROVIDE STRATEGIC EXPANSION OF HIGHWAY HELPER PROGRAM**

Highway Helper services provide responsive assistance to motorists on the interstate and freeway systems in the Des Moines, Council Bluffs, and Cedar Rapids/Iowa City metro area. The focus of the Highway Helper program is on getting people out of harm's way and maintaining traffic flow. There is growing need to expand Highway Helper services in the Des Moines area as well as to support upcoming long-term highway projects that require a reduction of capacity during construction (e.g., I-80/380 near Iowa City and I-74 Bridge Reconstruction in Quad Cities)

Recommended Services and Activities:

- Complete work with CTRE to determine where additional Highway Helper services are required in the Des Moines metro area
- Develop a Concept of Operations (ConOps) for enhanced Highway Helper services
- Develop new Request for Proposal (RFP) for expanded Highway Helper services

#### **S4. TRACK EMERGENCY RESPONSE AND HIGHWAY WORKER STRUCK-BY AND NEAR-MISS INCIDENTS**

Struck-by incidents are the second leading cause of accidental deaths to law enforcement (behind vehicle collisions). It is currently very difficult to obtain struck-by information and near-miss data simply doesn't exist.

Recommended Services and Activities:

- Convene multidisciplinary group to define how to collect struck by data and define a near-miss
- Use data to develop countermeasures to eliminate struck-by and minimize future near misses

#### **S5. INTEGRATE TIM PRINCIPLES INTO DRIVER EDUCATION CURRICULUM**

The primary laws related to TIM: authority removal, move-over, and driver removal (i.e., quick clearance) are minimally covered in current driver education course and exam materials. Educating new drivers on the rules of the road, especially what to do when involved in a crash will improve safety because they will relocate to a safe location.

Recommended Services and Activities:

- Engage DMV in helping to develop new TIM related course materials and exam questions

#### **S6. DEVELOP MULTI-AGENCY TIM SCENE GUIDELINES**

The safety of all responders is of paramount importance. Developing Emergency Traffic Control and Scene Management Guidelines will enable and promote statewide consistency in establishing the safest possible work environment for incident responders. It is important the development of the guidelines follow the Manual on Uniform Traffic Control Devices (MUTCD) and include a multi-discipline approach, possibly through creation of a Statewide TIM Committee task force.

Recommended Services and Activities:

- Assess peer state Scene Guidelines
- Create task force under Statewide TIM Committee to guide development
- Assign resources to develop draft TIM Scene Guidelines

## **R1. DEVELOP AND TRACK RESPONSE AND CLEARANCE TARGETS**

Mutually supported response time targets are important to scene safety, patient outcomes, and system reliability. Developing and tracking response targets statewide allow identification of response and resource needs.

Clearance time targets can be set through policy and multiagency agreements to reduce impact to the transportation system and exposure to responders and the traveling public. Setting and tracking these targets supports system reliability and safe system.

Recommended Services and Activities:

- Work with ISP , Iowa Peace Officers Association, Iowa Firefighters Association, Iowa Emergency Medical Services Association and Iowa Association of County Medical Examiners to develop statewide response targets
- Develop data sharing across TIM disciplines to track average response and clearance times

## **R2. STANDARDIZE CRASH SCENE INVESTIGATION IN PARTNERSHIP WITH IOWA ASSOCIATION OF COUNTY MEDICAL EXAMINERS**

Fatal crash scenes often have increased clearance times resulting from scene investigation requirements. Standardized crash scene investigation practices support quick clearance as well as scene safety and accurate crash reporting. Developing and implementing standardized investigation protocols statewide requires coordination with law enforcement and medical examiners to ensure their support in implementation.

Recommended Services and Activities:

- Work with ISP and Iowa Association of County Medical Examiners to develop standardized crash scene investigation to be applied statewide

## **R3. ADDRESS TIM IN TRAFFIC CRITICAL PROJECTS DEVELOPMENT PROCESSES**

Iowa DOT has been a leader in systematically assessing and mitigating the impact of work zones throughout the state through its TCP program. Expanding on these plans to formally address TIM on all TCPs will enhance traveler safety and system reliability.

Recommended Services and Activities:

- Develop a standardized approach to TIM on all TCPs statewide
- Formalize TIM activities for TCPs into ongoing TIM program after projects are completed
- Incorporate standardized approach to TIM into all project work zone plans (e.g., geometrics for TIM, Motor Vehicle Enforcement (MVE) and other law enforcement support, protecting the queue, etc.)

## **R4. PILOT HEAVY TOW AND RECOVERY INCENTIVE PROGRAM**

Towing and Recovery Incentive Programs facilitate improved management of large-scale commercial vehicle incidents. Large-scale incidents can significantly affect traffic, causing long motorist delays,

polluting the air, and creating safety hazards. Towing and recovery incentive programs encourage the quick, safe clearance of these incidents by paying performance incentives to highly-skilled, certified towing and recovery companies for clearing wrecks within established clearance targets.

Recommended Services and Activities:

- Investigate legal issues in establishing incentive program
- Convene peer exchange with other state DOTs that have successfully implemented
- Develop a concept of operations that defines the program and clarifies who has ability to declare incentive program incidents
- Establish pilot location (e.g., Des Moines area) and secure funding
- Solicit and certify incentive program participants

## **E1. STATEWIDE DIVERSION ROUTES**

Preplanned diversion routes allow prompt rerouting of traffic in the event of a highway closure or significant incident. Developing preplanned routes for all Interstate and major highway segments allows quick response to incidents that close the highway. It ensures efficiency by predetermining alternate traffic routes that are capable of handling freight and highway traffic in the event of a closure or long-term incident.

Recommended Services and Activities:

- Review and update all diversion routes currently in place for Iowa highways
- Develop diversion route plans for all Interstate and state highways that do not have a plan in place
- Work with neighboring states to include Interstate diversions, especially at high volume bridge border crossings
- Create on-line library of all TIM plans and diversion routes and make it available to all response agencies and media

## **E2. CREATE TMC CONCEPT OF OPERATIONS AND INTER-GOVERNMENTAL AGREEMENTS TO INTEGRATE TRAFFIC SIGNAL CONTROL DURING EVENTS**

Traffic signals in Iowa fall under the jurisdiction of local agencies. To support diversion routes on surface streets, it is important to work with local agencies to develop traffic signal control plans for incidents and, where possible, integrate the operation of the signal system to support temporary traffic diversions.

Recommended Services and Activities:

- Create a concept of operations and inter-governmental agreements needed to integrate traffic signal control between local agencies and Iowa DOT
- Select a pilot corridor to demonstrate benefits of integrated corridor management during traffic incidents
- Work with neighboring states to include interstate diversions

### **E3. PROMOTE QUICK CLEARANCE LAW**

The State Legislature recently passed a Quick Clearance law to require drivers involved in a minor incident to move their vehicle from the travel lanes. It is important the new law be promoted to encourage quick clearance of incidents and support system efficiency and safety.

Recommended Services and Activities:

- Work with the Office of Strategic Communications to develop a public information campaign to educate the public about the Quick Clearance law
- Install regulatory signs at key locations on Interstates to support compliance
- Work with insurance industry and DMV to incorporate clearance law in driver training curriculum

### **E4. PRE-STAGE RESPONSE EQUIPMENT**

Pre-staged response equipment at key locations can provide quick deployment of traffic control at incidents, improving scene management, safety and efficiency.

Recommended Services and Activities:

- Develop list of equipment to be included on pre-staged trailer or truck
- Identify locations, at least one in each district, for pre-staged equipment
- Stage equipment that meets the equipment list in each of the predetermined locations

### **CON1. PROVIDE MOTORISTS WITH TRAVEL TIME ESTIMATES DURING TRAFFIC INCIDENTS**

Real time travel time estimates associated with incidents enhance convenience and system efficiency by allowing travelers to make informed decisions about travel (e.g., divert or wait). The Des Moines area is currently providing travel time on 511 and DMS.

Recommended Services and Activities:

- Implement travel time estimating capability statewide for all Interstates and priority state highways
- Provide travel time estimates on DMS and 511
- Identify additional locations for DMS and additional travel information outlets (social media, apps, etc.)

### **CDN1. DEVELOP A STATEWIDE JOINT OPERATIONS POLICY FOR TIM**

A Joint Operations Policy between Iowa DOT and ISP will help improve safety throughout Iowa. Joint operating procedures are recommended to be developed and maintained in the following areas:

- Sharing transportation-related information between agencies
- Mobilizing forces to support field operations
- Maintaining an Open Roads Policy to ensure the most efficient removal of vehicles from state roadways after an incident
- Promoting the safety of all emergency responders
- Developing the highest level of interagency training

- Disseminating timely, accurate information to the public
- Ensuring the highest level of winter readiness on state roadways.

The Joint Operations Policy should be discussed on an annual basis by senior leadership at Iowa DOT and ISP to review previous activities and identify opportunities for continued coordination and collaboration.

Recommended Services and Activities:

- Establish a TIM-focused group within each district MDST
- Develop standardized format for TIM groups and guidance for developing district priorities, activities and services

## **CDN2. DEVELOP A COMPREHENSIVE IOWA DOT TIM PROGRAM SOP**

Development of an internal TIM Program SOP will help provide clarity on the roles and responsibilities of Iowa DOT within the context of the broader TIM community. Topics with detailed activities in the SOP should include at a minimum:

- Iowa DOT's ongoing support of TIM-related Training (e.g., ICS, SHRP2, tabletop exercises, etc.)
- Highway Helper
- DOTs role within ICS and TIM
- DOTs role in responding to different types of traffic incidents
- The TMCs role supporting TIM
- Alternate Route Planning/ Maintenance of TIM Plans
- TIM and Traffic Critical projects

Recommended Services and Activities:

- Convene small group to develop annotated outline of SOP
- Assign internal or external resources to develop and test different sections of the SOP
- Publish and provide awareness of SOP to internal stakeholders

## **CDN3. FORMALIZE MULTIAGENCY TIM TEAMS IN EACH DISTRICT**

Iowa currently has multiagency teams focused on TIM in major urban areas and is integrating TIM into the Multidisciplinary Safety Teams. It is important to formalize TIM as a core function of MDSTs and to coordinate TIM statewide.

Recommended Services and Activities:

- Establish a TIM-focused group within each district MDST
- Develop standardized format for TIM groups and guidance for developing district priorities, activities and services



#### **CDN4. CREATE ONLINE TIM CREDENTIAL-CONTROLLED AND UNCONTROLLED INFORMATION TO PROGRAM MEMBERS**

An online TIM site would provide a single point of access for incident information and resources, including TIM plans, diversion maps, resource inventories, response agency contacts, ITS equipment locations, pre-staged equipment inventories and locations, communications information, access to incident data and video feeds. Credential control would allow TIM program members to log in to access sensitive information that would not be shared publicly.

##### Recommended Services and Activities:

- Work with response agency partners to determine appropriate content for the site and develop a site map with controlled and uncontrolled data
- Develop website and content maintenance protocol

#### **CDN5. EXPAND MULTIAGENCY RESOURCE MANAGEMENT**

Multiagency resource management and ordering is critical to quick and efficient TIM response. Resource typing, common in fire and emergency management, should be expanded to include highway equipment (including IWZ resources) and towing and recovery for enhanced and timely response to traffic incidents.

##### Recommended Services and Activities:

- Inventory and type Iowa DOT using National Incident Management System (NIMS) Resource Typing and any additional details that may be needed.
- Develop online database for Iowa DOT resources
- Work with local agencies to type resources and include in online database
- Develop protocols for tracking and ordering resources

#### **CDN6. EXPAND AND ENHANCE TIM TRAINING**

Iowa DOT sponsors the National TIM Responder Training Program and conducts an annual Statewide TIM Conference. These should be continued and enhanced to support coordination across the TIM response community.

##### Recommended Services and Activities:

- Continue to support Statewide TIM Conference in collaboration with Statewide TIM Committee
- Offer National TIM Responder Training in multiple locations around the state on a rotating schedule (including nights and weekends)
- Develop grant program to pay TIM instructors in partnership with Iowa State LTAP or others (possible non-profit organization mentioned in CDN10)
- Work with local response agencies (fire, law enforcement and EMS) to offer 1-2 hour TIM trainings in conjunction with shift briefings and department training programs
- Look at opportunities to increase the number of trained Technical Investigators to help reduce response times across the state when accident reconstruction is required

## **CDN7. DEVELOP ON-SCENE INTEROPERABLE COMMUNICATIONS**

On-scene communication and multiagency communication between dispatch centers is critical to a coordinated, safe and efficient scene. Further work is needed to enhance on-scene interoperability across all response agencies. This includes establishing common frequencies, systems and protocols for interagency, on-scene communication.

Recommended Services and Activities:

- Establish common frequencies or call groups for incidents on Interstates and state highways
- Develop multidiscipline communication protocols based on NIMS principles to support interoperable on-scene communications

## **CDN8. SHARE DATA/VIDEO BETWEEN AGENCIES**

Data and video feeds are critical resources for planning for and responding to traffic incidents. Multiagency data sharing supports resource management and enhances coordinated response. While video sharing exists (primarily one-way from Iowa DOT to others), the video feeds should be two-way between local agencies and Iowa DOT and should include enhanced data and video sharing as well as protocols on video recording and retention.

Recommended Services and Activities:

- Establish multiagency committee to determine data and video sharing feasibility and develop and/or update necessary memoranda of agreement
- Develop interoperable data and video sharing in major urban areas
- Develop interoperable data and video sharing statewide

## **CDN9. DEVELOP FRAMEWORK TO GATHER, ANALYZE AND SHARE TIM DATA AMONGST EMERGENCY RESPONSE PARTNERS**

Incident data from crash reports provide critical information on type of incident, response and duration of incident, responders or pedestrians involved, and secondary incidents. Emergency response agencies also maintain internal incident reports that contain important incident information. Currently these data are not readily available to support TIM program performance management, especially across agencies. These and other data are essential to TIM program performance management and should be integrated into a common framework.

Recommended Services and Activities:

- Work with ISP to review and revise incident data reporting and data analysis
- Establish multiagency committee to develop a framework for sharing incident reports across disciplines to support TIM planning and program management
- Take steps to integrate incident data from response agencies into a shared data base
- Develop tools that integrate data sources from multiple agencies to enhance TIM situational awareness

## **CDN10. CONVERT STATEWIDE TIM COMMITTEE TO BE A NON-PROFIT ORGANIZATION**

The statewide TIM Committee has been active for about a year. The group is supportive of converting itself to be a 501(c)(3) non-profit organization to allow for more operational flexibility. Since the group was started by Iowa DOT, there are limitations within state government on supporting some activities. For example, a non-profit organization would allow for creation of grant fund to help cover some costs to volunteer SHRP2 trainers. A non-profit could also possibly allow for collecting sponsorships and registration fees at upcoming conferences.

### Recommended Services and Activities:

- Recruit Board of Directors
- Prepare and file nonprofit articles of incorporation with the Iowa Secretary of State
- Prepare Bylaws
- Hold organizational board of directors meeting to adopt bylaws, elect officers, discuss other business
- Obtain Your Federal and State Tax Exemptions

## 5-Year TIM Program Activities Schedule

Table 17 translates the proposed recommendations into a 5-year schedule.

TABLE 17. 5-YEAR TIM PROGRAM ACTIVITIES SCHEDULE

| Service/Activity/Project                                                                        | FY 2018 | FY 2019 | FY 2020 | FY2021 | FY2022 |
|-------------------------------------------------------------------------------------------------|---------|---------|---------|--------|--------|
| S1. Provide Move Over law education                                                             |         |         |         |        |        |
| S2. Develop towing and recovery personnel qualifications                                        |         |         |         |        |        |
| S3. Provide strategic expansion of Highway Helper Program                                       |         |         |         |        |        |
| S4. Track Emergency Response and Highway Worker Struck-by and Near-Miss Incidents               |         |         |         |        |        |
| S5. Integrate TIM principles and related laws into Driver Education Curriculum                  |         |         |         |        |        |
| S6. Develop multi-agency TIM Scene Guidelines                                                   |         |         |         |        |        |
| R1. Develop statewide response and clearance targets                                            |         |         |         |        |        |
| R2. Standardize crash scene invest. in partnership with Iowa Assoc. of County Medical Examiners |         |         |         |        |        |
| R3. Address TIM in TCP development processes                                                    |         |         |         |        |        |
| R4. Pilot Heavy Tow and Recovery Incentive Program                                              |         |         |         |        |        |
| E1. Implement statewide diversion routes                                                        |         |         |         |        |        |
| E2. Create TMC ConOps and agreements to integrate traffic signal control during events          |         |         |         |        |        |
| E3. Promote Quick clearance laws                                                                |         |         |         |        |        |
| E4. Pre-stage response equipment                                                                |         |         |         |        |        |
| CON1. Provide motorists with travel time estimates during incidents                             |         |         |         |        |        |
| CDN1. Develop a statewide Joint Operations Policy for TIM                                       |         |         |         |        |        |
| CDN2. Develop a comprehensive Iowa DOT TIM Program SOP                                          |         |         |         |        |        |
| CDN3. Formalize multiagency TIM teams in each District                                          |         |         |         |        |        |
| CDN4. Create online TIM credential-controlled and uncontrolled info. to program members         |         |         |         |        |        |
| CDN5. Expand multiagency resource management                                                    |         |         |         |        |        |
| CDN6. Expand and enhance TIM training                                                           |         |         |         |        |        |
| CDN7. Develop on-scene interoperable communications                                             |         |         |         |        |        |
| CDN8. Share data/video between agencies                                                         |         |         |         |        |        |
| CDN9. Develop framework to gather, analyze and share TIM data amongst emergency responders      |         |         |         |        |        |
| CDN10. Convert Statewide TIM Committee to be a Non-Profit Organization                          |         |         |         |        |        |

## PART 7. 5-YEAR SERVICE LAYER COST ESTIMATE

The TSMO Program budget is currently broken in four categories:

- Systems and Technical Services
- Traffic Incident and Emergency Management
- Traffic Operations Research and Decision Support
- TMC Services

Based on the proposed service and activities, the annual Traffic and Emergency Management budgets have been refined by fiscal year and are shown in Figure 15. Components of the proposed budget include:

- Highway Helper (including strategic expansion)
- Traffic Critical Projects
- TIM Programmatic Support
- TIM Plans
- TIM Training
- EM Training
- Incentive Towing Pilot Program
- TIM Training Facility Maintenance
- Real-Time TIM Data Sharing Project

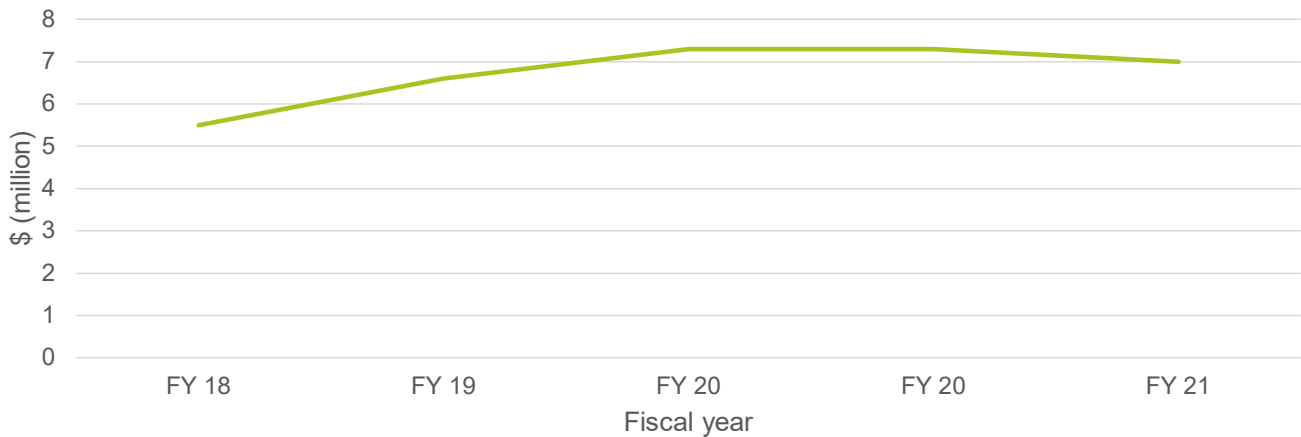


FIGURE 15. PROPOSED FY 2018-22 BUDGET

# APPENDIX A. TRAFFIC INCIDENT MANAGEMENT BLUEPRINT

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# Iowa DOT Traffic Incident Management Blueprint

VERSION 1.0

## IOWA DOT COMMITMENT TO TRAFFIC INCIDENT MANAGEMENT

The Iowa Department of Transportation (DOT) is dedicated to enhancing mobility for Iowans through innovation, infrastructure and information. A critical component of this vision is the safe and effective management of the transportation system statewide. The Iowa DOT is building a Transportation System Management and Operations (TSM&O) Program to support the social and economic vitality of Iowa, increase safety and maximize customer satisfaction. The TSM&O Program includes a number of critical services that support the Iowa DOT's strategic vision. These services include traveler information, weather-related response and management, special event management and emergency transportation.

The management of Iowa's transportation system during emergencies is essential to the safety and vitality of Iowa's communities, economy and safety. Traffic incidents affect the safety of the traveling public and the emergency responders at the scene of incidents. These incidents also impact the movement of goods and services on the highways and travel reliability for Iowans. Iowa's highways experience a wide range of incidents, from minor crashes to hazardous materials spills and multi-vehicle pileups. Traffic Incident Management (TIM) provides a systematic, coordinated approach to managing incidents on the highway system to minimize impacts to the traveling public and enhance the safety of those involved in and responding to those incidents.

Effective TIM requires collaboration between emergency responders, such as law enforcement and fire/rescue, towing/recovery, DOT maintenance and operations, and local



agencies. Iowa DOT is committed to enhancing the historically strong relationships between these partners. This TIM Blueprint is an important step in formalizing TIM initiatives and setting a strategic direction for the Iowa DOT TIM program as a key service of the DOT's TSM&O Program.

## THE NEED FOR A TIM BLUEPRINT

In December 2013, the Iowa DOT and the Iowa Department of Public Safety endorsed the *State of Iowa Emergency Transportation Operations* (ETO) Plan. This plan was the result of lessons learned during the 2011 floods and was a formal step toward establishing an ETO Program for Iowa. The purpose of the plan is to develop a standardized, well-rehearsed, all-hazards approach to large scale incident management consistent with the National Incident Management System (NIMS).

In October 2013, the Iowa DOT conducted a workshop to determine its current state of development across a number of dimensions of effectiveness in TSM&O. This workshop was conducted using a tool based on continuous improvement management principles and developed specifically for DOT TSM&O implementation, the Capacity and



Maturity Model (CMM). The CMM process recommended a number of actions to enhance Iowa DOT's management of traffic incidents, including efforts to formalize TIM through performance management, collaboration, staffing and communications. This TIM Blueprint is intended to address these issues in coordination with the Iowa ETO Plan and the Iowa DOT's TSM&O Program Plan, also under development as a recommended action from the CMM workshops.

### DEVELOPING THE TIM BLUEPRINT

In the spirit of collaboration essential to successful development and implementation of TIM programs, the Iowa DOT conducted 10 regional TIM workshops across Iowa in the fall of 2014, to learn how the DOT and its partners could work together to improve emergency responder safety and achieve safe, quick clearance of crashes that impact travel. The TIM Blueprint is designed to address the needs identified through the workshops and to coordinate with and complement the Iowa DOT ETO Program, which focuses on all-hazard preparedness, response and mitigation for a variety of local, regional and nationally significant events that could affect Iowa. The TIM Blueprint serves as a strategic action plan that can be used to program and prioritize TIM efforts, projects, and initiatives.

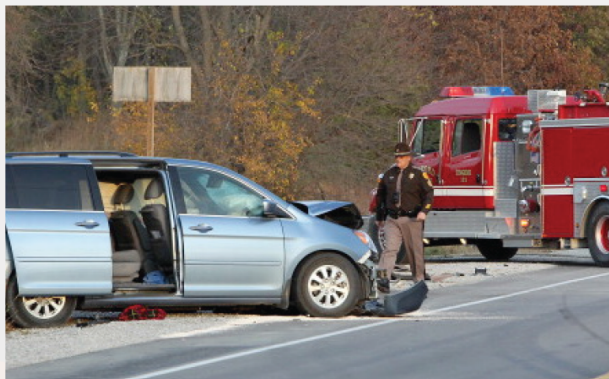
The TIM Blueprint addresses cross-cutting needs faced by TIM practitioners across the state of Iowa. Analysis of conversations that took place in the TIM workshops resulted in six overarching program areas:

- ▶ Legislation
- ▶ Organization
- ▶ Communication and coordination
- ▶ Practitioner capacity building
- ▶ Driver education and public outreach
- ▶ Technology and institutional agreements to support partnerships

### KEY ISSUES

Key issues were identified during the TIM workshops. These are addressed within the various program areas and include:

- ▶ TIM plans and pre-planned alternate routes are not in place in all areas.
- ▶ Formal agreements are needed between agencies to address TIM planning, roles and responsibilities, and clearance goals.
- ▶ TIM performance measures and supporting data collection and tracking are needed.
- ▶ The National Incident Management System (NIMS) Incident Command System (ICS) and Unified Command are not used consistently throughout the state.
- ▶ After Action Reviews (AAR) should be used throughout the state.
- ▶ Towing/recovery should be involved consistently in a multi-agency approach to TIM.
- ▶ Emergency lighting and personal protective equipment (PPE) procedures are needed.
- ▶ Multi-agency training should be continued and expanded.



## PROGRAM AREAS

The TIM Blueprint outlines activities and actions that will benefit the entire state within each of the six overarching program areas. Region-specific priorities are identified and included where applicable.

### *Legislation*

Legislation is often needed to address various legal and regulatory challenges faced by the TIM community. A number of legislative initiatives have been effective in advancing safety at incident scenes, including Iowa's Move Over or Slow Down law. Currently, the Iowa DOT is working to enact legislation that establishes minimum towing and recovery personnel qualifications. It is important that this legislation has the support of the Towing Association before approaching legislators. This initiative will improve the safety of operators, the traveling public and other on-scene emergency responders.



### *Organization*

Leadership support for the ETO/TIM Program and future enhancements is critical to program success. The following recommendations came out of the TIM workshops with regard to TIM organization:

- ▶ Establish a statewide TIM Technical Working Group with representation from emergency medical services, fire/rescue, law enforcement, transportation, public works, towing and recovery, emergency management, insurance, the Governor's Traffic Safety Bureau, and public user organizations, in coordination with the Integrated Safety and Transportation Executive Committee (ISTEC).
- ▶ Develop a multi-disciplinary, open roads policy that addresses the use of high-visibility personal protective equipment, road clearance time goals, a commitment to implementing unified command, and an event escalation process. This policy will provide consistency in emergency and incident management across disciplines throughout the state.
- ▶ Partner with the Iowa Association of County Medical Examiners to develop a standardized approach to vehicular crash scene response and investigation.
- ▶ Commit to measuring and reporting incident duration, incident clearance, and secondary crashes on freeways by modifying law enforcement crash reporting forms, ATMS, DOT crash records systems, and other supporting elements to track roadway clearance time, incident clearance time, secondary crashes as well as emergency responder and highway worker struck-by and near-miss incidents. Tracking and evaluating these measures will require multi-agency actions to add specific checkboxes on forms and develop mechanisms to track other data needed for performance measures.

### ***Sustained Communication and Coordination***

Effective TIM programs require sustained communication and coordination among the multiple disciplines and response agencies. To achieve sustained communication and coordination, it is recommended that the following actions are taken:

- ▶ Establish multi-disciplinary TIM steering committees in each region by building on relationships with planning partners, multi-disciplinary safety teams (MDST), and local emergency planning committees. This can be accomplished by adding TIM to MDSTs, rather than the creation of new groups. Specific steps to meet this objective include:
  - » Develop small steering committees to provide leadership, emulate the principles of unified command, and guide regional priorities over time.
  - » Develop a leadership structure that can evolve over time to meet the committees' needs and changing responsibilities.
  - » Work with MPOs to provide leadership through administrative and programmatic support.
- ▶ Create an Iowa DOT TIM Program Guide to support the development of consistent annual work plans. The Program Guide should address TSM&O service layers, performance management, strategic renewal (renew, revise, update priorities), and detailed work planning (policies, training, etc.).
- ▶ Conduct an annual TIM/ETO conference to share practices and lessons learned, and provide exposure to the nation's best practices.
- ▶ Develop regional and critical project TIM diversion plans.
- ▶ Create a TOC concept of operations (COO) that addresses the possible integration of traffic signal control during events. The COO should address technology and staffing requirements for the TOC as well as inter-governmental agreements for signal control.
- ▶ Integrate relevant TIM considerations into the Iowa DOT infrastructure improvement planning and design process.
- ▶ Address TIM in construction TMPs on traffic critical projects.
- ▶ Establish a dedicated ETO/TIM presence on the internet that provides credential-controlled and uncontrolled information to program members.
- ▶ Establish a traffic safety equipment purchase plan whereby local response agencies can purchase needed supplies and equipment through a statewide contract to reduce costs.
- ▶ Highlight the value of continuous communication.
- ▶ Create a statewide TIM plan for continuity for all regions. Reinvigorate and renew the regional TIM plans and roll them into a statewide plan, with an emphasis on Interstate corridors.



**SUSTAINED COMMUNICATION AND COORDINATION  
REGION-SPECIFIC PRIORITIES**

|                       |                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------|
| <b>Ames</b>           | Use TIM as a way to renew and support MDST meeting agendas.                                            |
| <b>Cedar Rapids</b>   | Reach out to the local towing community to engage them in TIM activities.                              |
| <b>Council Bluffs</b> | Engage the Nebraska Department of Roads to establish regional consistency in approach and measurement. |
| <b>Dubuque</b>        | Engage the MDST Coordinator to develop a TIM focus within the MDST.                                    |
| <b>Davenport</b>      | Work with the MDST to form a working group to update the TIM Plan and integrate it into operations.    |
| <b>Iowa City</b>      | Develop an after-action review process and procedure.                                                  |
| <b>Waterloo</b>       | Re-establish a TIM presence in this area.                                                              |





**Practitioner Capacity Building**

A successful TIM program will help prepare the next generation of leadership and practitioners through an ongoing commitment to capacity building. The following activities are intended to support practitioner capacity building in Iowa:

- ▶ Participate in national activities to develop a TIM Incident Command School.
- ▶ Develop a grant program to pay TIM instructors for conducting classroom TIM training in partnership with the Iowa State University Local Technical Assistance Program.
- ▶ Commit to ongoing training and re-training at a national level.
- ▶ Partner with Iowa State University to host and maintain a statewide TIM training database.

**PRACTITIONER CAPACITY BUILDING  
REGION-SPECIFIC PRIORITIES**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cedar Rapids</b>   | <ul style="list-style-type: none"> <li>• Compile a lessons learned report regarding the medical examiner's approach to fatal investigation, including alternatives to scene response by the medical examiner.</li> </ul>                                                                                                                                                                                                                         |
| <b>Council Bluffs</b> | <ul style="list-style-type: none"> <li>• Disseminate information and educate practitioners about alternate routes and how to use them effectively.</li> <li>• Offer ICS-300 with TIM events as classroom exercises to encourage a dialog about on-scene roles and responsibilities.</li> <li>• Conduct targeted outreach regarding the necessity and benefit of wearing safety vests.</li> </ul>                                                 |
| <b>Dubuque</b>        | <ul style="list-style-type: none"> <li>• Conduct table top exercises designed to increase awareness and use of the TOC.</li> <li>• Conduct TIM training with an emphasis on MUTCD awareness.</li> <li>• Offer ICS-300 with TIM events as classroom exercises to encourage a dialog about on-scene roles and responsibilities.</li> <li>• Document the struck-by reporting process so it can be examined for statewide implementation.</li> </ul> |
| <b>Davenport</b>      | <ul style="list-style-type: none"> <li>• Work with the Scott County Sheriff's Office to support their delivery of SHRP2 training and identify future training opportunities.</li> <li>• Distribute agency specific ANSI/MUTCD compliant vests.</li> <li>• Compile a lessons learned report regarding the move-over laws projects the State Patrol completed; include experiences from Dubuque.</li> </ul>                                        |
| <b>Iowa City</b>      | <ul style="list-style-type: none"> <li>• Offer ICS-300 with TIM events as classroom exercises to encourage a dialog about on-scene roles and responsibilities.</li> <li>• Compile a lessons learned report regarding the regional towing and recovery system in use in Iowa City.</li> </ul>                                                                                                                                                     |
| <b>Sioux City</b>     | <ul style="list-style-type: none"> <li>• Compile lessons learned report regarding use of unified command by fire, transportation and insurance to deal with HAZMAT incidents.</li> <li>• Conduct targeted outreach regarding the necessity and benefit of wearing safety vests.</li> </ul>                                                                                                                                                       |

### ***Driver Education and Public Outreach***

Driver education and public outreach are important to the safety of on-scene responders and incident victims. Working with other agencies to promote driver education and public outreach, the DOT can prepare drivers to move through a scene safely or avoid incidents by choosing alternate routes. Specific actions can be taken to enhance driver education and public outreach, including:

- ▶ Provide timely and accurate incident information to travelers through Iowa's 511 system.
- ▶ Partner with Iowa State University and the Iowa Department of Motor Vehicles to evaluate the feasibility of including TIM-focused laws in the driver education curriculum.



- ▶ Implement an outreach campaign with AAA and others in conjunction with the Strategic Highway Safety Plan and Towards Zero Deaths Initiatives.

### ***Technology and Institutional Agreements***

The increased use of technology and the data available through new technology can be used to support safe and effective traffic incident management. As TIM is multi-disciplinary and multi-jurisdictional, it is important to identify and develop institutional agreements needed to use technology and data effectively. A number of steps can be taken to enhance coordination through institutional agreements:

- ▶ Partner with the Iowa State Patrol to merge incident data.
- ▶ Implement a priority TIM corridor program that focuses on arterials that serve as alternate routes for freeway diversions. Work should focus on traffic engineering fundamentals such as access management, signal system capability, arterial capacity, and system limitations or restrictions. Considerations should be given to adjacent land uses and traffic sensitive areas.
- ▶ Develop a strategic framework to gather and analyze data from all Iowa emergency response partners to allow the implementation of a performance management program, based on big data principles, that ties TIM to other TSM&O program areas. Evaluate partnership opportunities with Iowa State University.
- ▶ Develop a smartphone app as a future ETO/TIM dashboard for communication with emergency responders. Initial efforts should focus on the development of a TIM field guide and location-based services for alternate routes and nearby facilities.
- ▶ Coordinate with Iowa State Patrol and Sheriffs Association to create an inventory of crash investigation techniques for freeways and designated alternate routes, and establish a grant program to upgrade technology to reduce clearance times.

**TECHNOLOGY AND INSTITUTIONAL AGREEMENTS  
REGION-SPECIFIC PRIORITIES**

|                       |                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Council Bluffs</b> | <ul style="list-style-type: none"> <li>• Execute memorandums of understanding to document understood policies and procedures.</li> <li>• Engage the local PSAP to determine options to integrate CAD with ATMS for performance measure tracking.</li> <li>• Develop a policy for traffic signal timing modifications and investigate the feasibility of connecting to the TOC for remote changes.</li> </ul> |
| <b>Dubuque</b>        | <ul style="list-style-type: none"> <li>• Develop an equipment staging plan for freeway response.</li> </ul>                                                                                                                                                                                                                                                                                                  |
| <b>Davenport</b>      | <ul style="list-style-type: none"> <li>• Hold a communications rally in conjunction with Illinois to identify interoperability barriers and develop a gap closure plan.</li> </ul>                                                                                                                                                                                                                           |
| <b>Iowa City</b>      | <ul style="list-style-type: none"> <li>• Integrate the University into TIM and MDST activities.</li> <li>• Fund the purchase of and training for total station equipment for the Coralville Police Department as a pilot.</li> <li>• Investigate the upgrade of signal systems to allow for remote control from the TOC.</li> </ul>                                                                          |
| <b>Mason City</b>     | <ul style="list-style-type: none"> <li>• Develop a process to include fire/rescue in the information sharing process.</li> </ul>                                                                                                                                                                                                                                                                             |
| <b>Sioux City</b>     | <ul style="list-style-type: none"> <li>• Execute memorandums of understanding to document understood policies and procedures.</li> </ul>                                                                                                                                                                                                                                                                     |

The Iowa DOT TIM Blueprint provides a foundation for TIM activities in Iowa and supports the DOT's goals of safety, efficiency and quality of life. Through a structured approach to multi-agency, multi-disciplinary traffic incident management, the Iowa DOT will continue to enhance the safety and reliability of Iowa's highways for all its customers.

